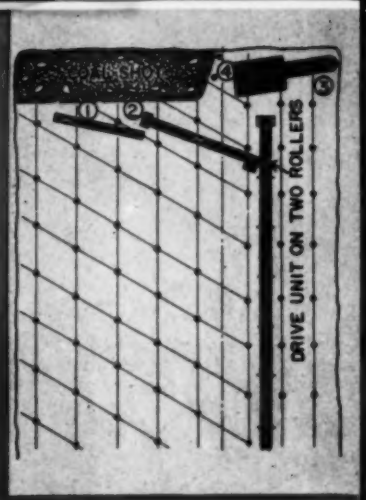
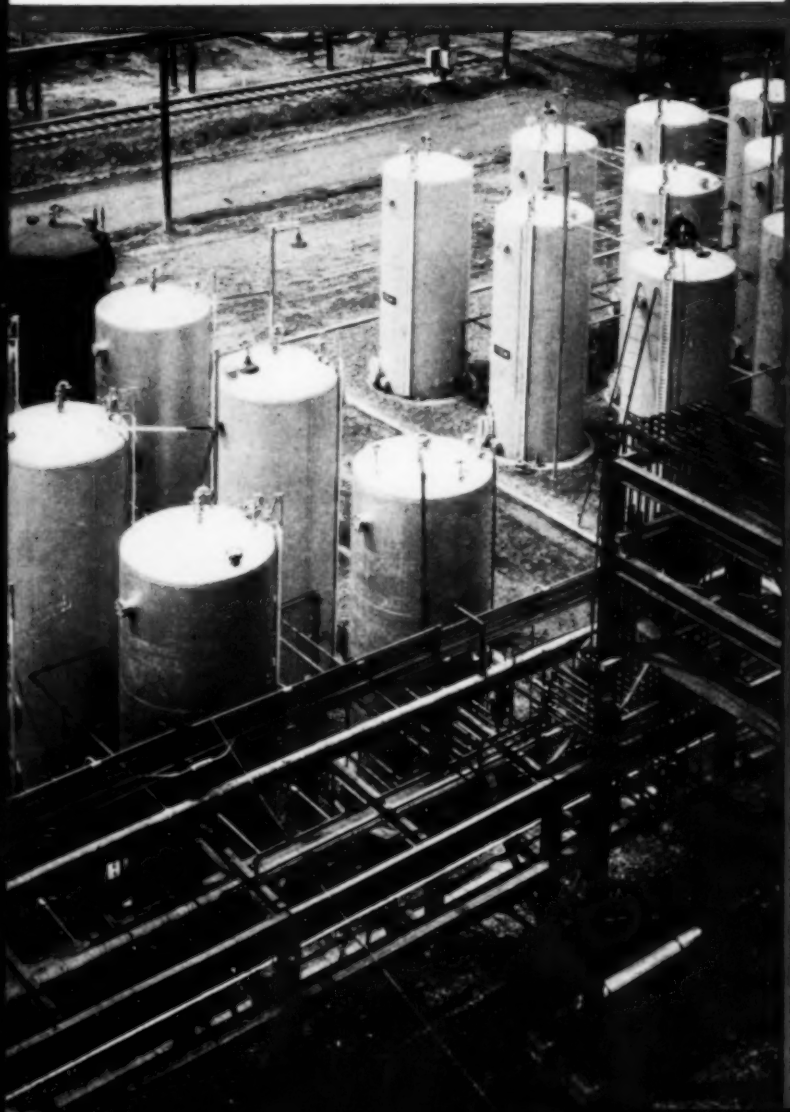
Coal Age

OCTOBER, 1952

A McGRAW-HILL PUBLICATION — PRICE 50c





Conveyor Change Ups Low-Coal Output

Jewell Ridge's redesigned face unit cuts moving time one-third, permits 15 tpm in 24- to 46-in coal. p 76

Inverted Trolley

Eliminating trolley poles and nips saves working time, with added safety at Cannelton Coal & Coke. p 86

Washer Costs Cut

Mine-built unit licks acid water, saves $18,000 per year in 600-tpd plant. p 94

Help Foremen Grow

Armco Steel's program for building up old and new foremen and why it pays. p 82

Coal Chemicals How Much?...When?

Why two top firms now are spending millions to take new chemicals from coal. p 70

Full Contents on p 5

Give..
THE UNITED WAY



The case of the

HAULAGE BREAKDOWN

It happened in the middle of the morning. Things were running smoothly—then production stopped. It didn't resume again that day.

With mine cars, this need never have happened—for mine cars minimize the danger of total transportation shut-down. When a car needs minor repair, it's shunted to a siding. The remaining cars continue working—maintaining the production schedule. *Only with mine cars is this possible!* ⚡ ⚡ ⚡ And there are other advantages, too. Men and supplies ride into the mine—making your transportation system pay both ways. ⚡ ⚡ ⚡ So, if you're planning a new mine, mechanizing your present mine, why not call in your A.C.F. Representative. He can give you some interesting facts on the advantages of A.C.F. Mine Cars. American Car and Foundry Company, New York · Chicago · St. Louis · Cleveland · Philadelphia · Washington · San Francisco · Berwick, Pa. · Huntington, W. Va.

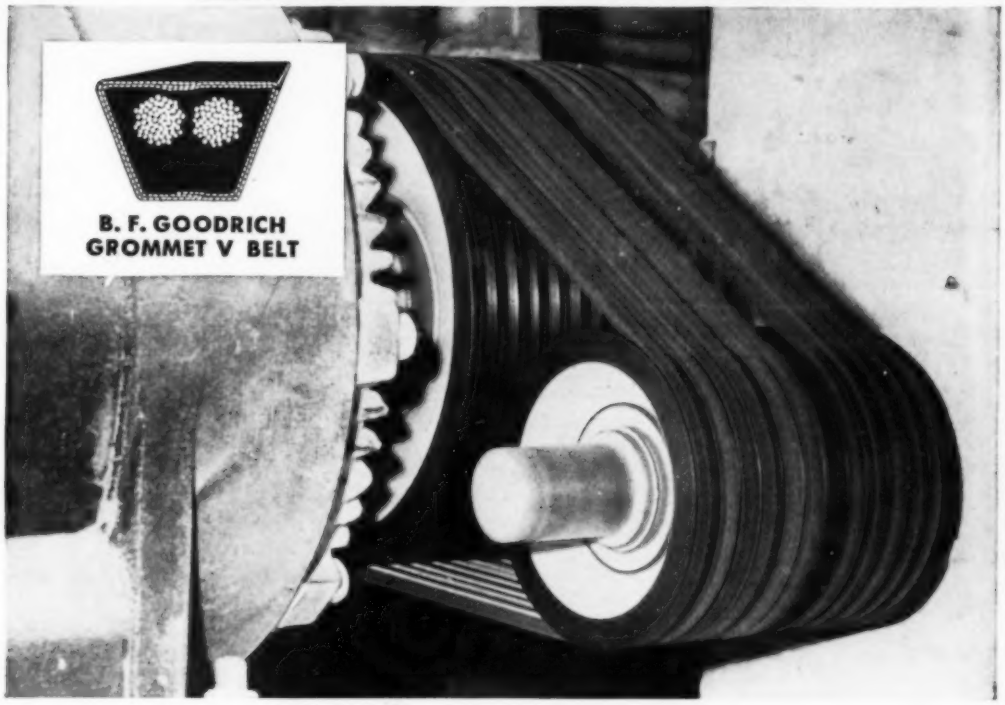


a.C.f.

MINE CARS

for Constant Haulage

RESEARCH KEEPS **B.F.Goodrich** FIRST IN RUBBER



Where B.F.Goodrich grommet belts outlasted others 3 to 1

B.F.Goodrich grommet V belts cut costs 20 to 50%

ORDINARY belts, previously used on this drive, couldn't stand the heavy load, couldn't take the strain of 24-hour-a-day service. There were frequent shutdowns for repairs. Belts were averaging only 3 months' life. Then B.F.Goodrich grommet V belts were installed. When the picture was taken, the grommet belts had already outlasted ordinary belts 3 to 1, maintenance costs had been cut nearly 100%, and the belts still looked good for a lot more service. Here's why:

No cord ends—A grommet is endless, made by winding heavy cord on itself to form an endless loop. It has no overlapping ends. Because most of the failures in ordinary V belts occur in the region where cords overlap, the endless cord section in a grommet V belt eliminates such failures.

Concentrated cord strength—All of the cord material in a B.F.Goodrich grommet belt is *concentrated* in twin grommets, positioned close to the driving faces of the pulley. There are no layers of cords to rub against one another and generate heat; cord and adhesion failures are reduced. And grommet V belts stretch less—only ⅓ as much, on an average, as ordinary V belts.

Better grip, less slip—Grommet V belts have more rubber in relation to belt size. Without any stiff overlap, they're more flexible, grip pulleys better. Size for size, grommet belts give ⅓ more gripping power, pull heavier loads with a higher safety factor. Because there is less slip, there is also less surface wear.

They cost no more—Grommet V belts cut costs because they last longer, increase production because machines keep running with fewer interruptions, reduce maintenance costs because they need less attention, yet they cost not one cent more. Available in C, D, and E sections. But remember, only B.F.Goodrich makes the grommet V belt (U. S. Patent No. 2,233,294), so to get all these savings, call in your local BFG distributor the next time you need V belts, or write *The B.F.Goodrich Company, Industrial & General Products Div., Akron, Ohio.* (Available in Canada)

Grommet V-Belts BY
B.F.Goodrich
FIRST IN RUBBER

Successful because
Made to meet



In every way, the Beaver is made-to-order for his job of survival. His keen teeth gnaw down trees and strip off their branches. His flat tail and webbed feet trowel and slap the sod and stones around the branches to form the dams that protect the sub-water-level entrances to his home. Nature made him 3-ways-efficient to meet specific conditions.

HULBURT OIL & GREASE COMPANY

Specialists in Coal Mine Lubrication

PHILADELPHIA, PA.

specific conditions

Just Like



Hulburt *Quality* GREASE

Hulburt Quality Grease is made ALL-WAYS efficient to meet the many-sided job of properly lubricating all kinds of coal mining machinery. This may look like a big job for one product to do, but years of use have proved that Hulburt Lubricants DO this job, and do it supremely well. If lubrication trouble is gnawing at your coal production—don't just "dam" it—use HULBURT.

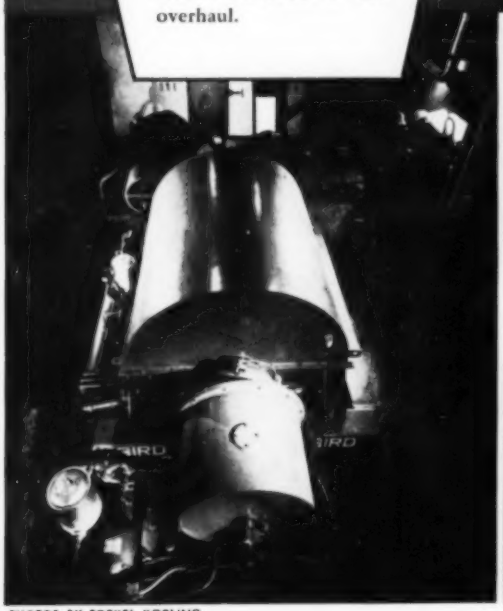
2 SIMPLE, EFFECTIVE WAYS TO MAKE COAL PREPARATION MORE PROFITABLE

1. Take the water out of your washed fine coal with the BIRD COAL FILTER

It does the job for one third the cost of other methods, and the coal is dry enough for direct loading or for thermal drying at minimum cost. Ton a minute capacity. Operates for months without shutdown for overhaul.

2. Take the extremely fine (minus 325 mesh), high ash refuse out of the water and make it closed circuit clean with the BIRD POLISHER

Used with a simple clarifying system the Bird discharges the fine solids dry enough for direct loading on a refuse belt and the system produces clear water for continuous recirculation. No water waste or pollution problem.





PHOTOS BY TORKEL KORLING

For the complete story, get in touch with

BIRD MACHINE COMPANY

SOUTH WALPOLE • MASSACHUSETTS

Coal Age

THIS MONTH'S COVER

SYMBOLIC of a new coal technology is this section of the new Union Carbide pilot plant (lower left), which in its entirety presents a piping maze that would top even the most ambitious TV spaceman's dream. Actually, that piping promises to add at least several dollars to the value of every ton of coal. Both Union Carbide and Pittsburgh Consol are spending millions to that end. You'll find the story of what they're doing (p 70) interesting and enlightening.

Ingenuity continues to be an important factor in efficient mine operation and the company-redesigned face conveyor (upper right) is a prime example. But this article (p 76) is only one of many examples sprinkled through the feature articles and Operating Ideas in this issue—and every issue of *Coal Age*.

COMING IN COAL AGE . . .

What Do Utilities Want From Coal?—How to mine and sell your coal to utilities, as told by a very good coal customer. These suggestions of what to do and not to do are particularly useful now, since utility coal consumption is slated for marked increase over the next few years.

How the German Planer-Miner Works in the U.S.—A special *Coal Age* report on the tests of this unusual machine as jointly carried on by EG&FA and the USBM.

New Ideas in belt-driving equipment that reduce belt cost are a part of the report on the new Roseann mine of the Panther Coal Co.

Froth-Flotation at Locust Summit—Operating details of P&R's modern fine-coal plant, where market acceptance of the product has recently led to doubling of its capacity.

OCTOBER • 1952

Editorials: Coal for Chemicals; Paring It Down; Critical Day 69

Coal for Chemicals . . . How Much? . . . and When? 70
How Pittsburgh Consol and Union Carbide are pioneering new frontiers.

Conveyor Redesign Ups Efficiency—J. R. SHORTRIDGE 76
Company-built face unit boosts output in thin coal and tough conditions.

Truck Coal Extends Washer Life 80
Mechanized truck mines will keep modern plant shipping 2,000 tpd.

Helping Foremen Grow—ALEX KELEMAN 82
Armco training builds up foremen, gets them on the management team.

Inverted Trolley Promotes Safety 86
Eliminating trolley poles and nips also saves production time, mine finds.

Repowering for Better Stripping 88
Why Enos bought six new truck engines, what it did with the old ones.

How Anthracite Is Adjusting for Continued Service 90
Past record, trends and outlook have a bearing on future progress.

World's Largest Excavator 93

Cutting Preparation Cost by Water-Neutralization Unit—WALTER E. MARRIOTT and JAMES E. LINN 94
Marriott-Reed built its own neutralizer to beat the acid-water problem.

Degassing With Boreholes—R. G. WUERKER 96
European Methods and results in cutting methane output underground.

Know Your Wire-Rope Fittings—W. C. RICHARDS 100

The Reader (ABC) His Mark 102

***Foremen's Forum:* Supervisors' Conferences** 104

Santa Claus Could Die of Old Age 110

Cables and Overhead Drum Control Truck Dump 112

Treadle Controls Siren to Warn of Backing Cars 112

New Unit for Fault and Overcurrent Protection 114

Good Trick With Mirrors 114

Mulga Handy-Andy 114

Tap Stations Clear Trolley Wire 116

Here's One Way To Reduce Underground Fire Hazards 116

Strippings Show How to Stop Stream Pollution 116

How to Get More Service From Industrial Hose 117

Equipment News and Bulletins 119 ***News Round-Up*** 127

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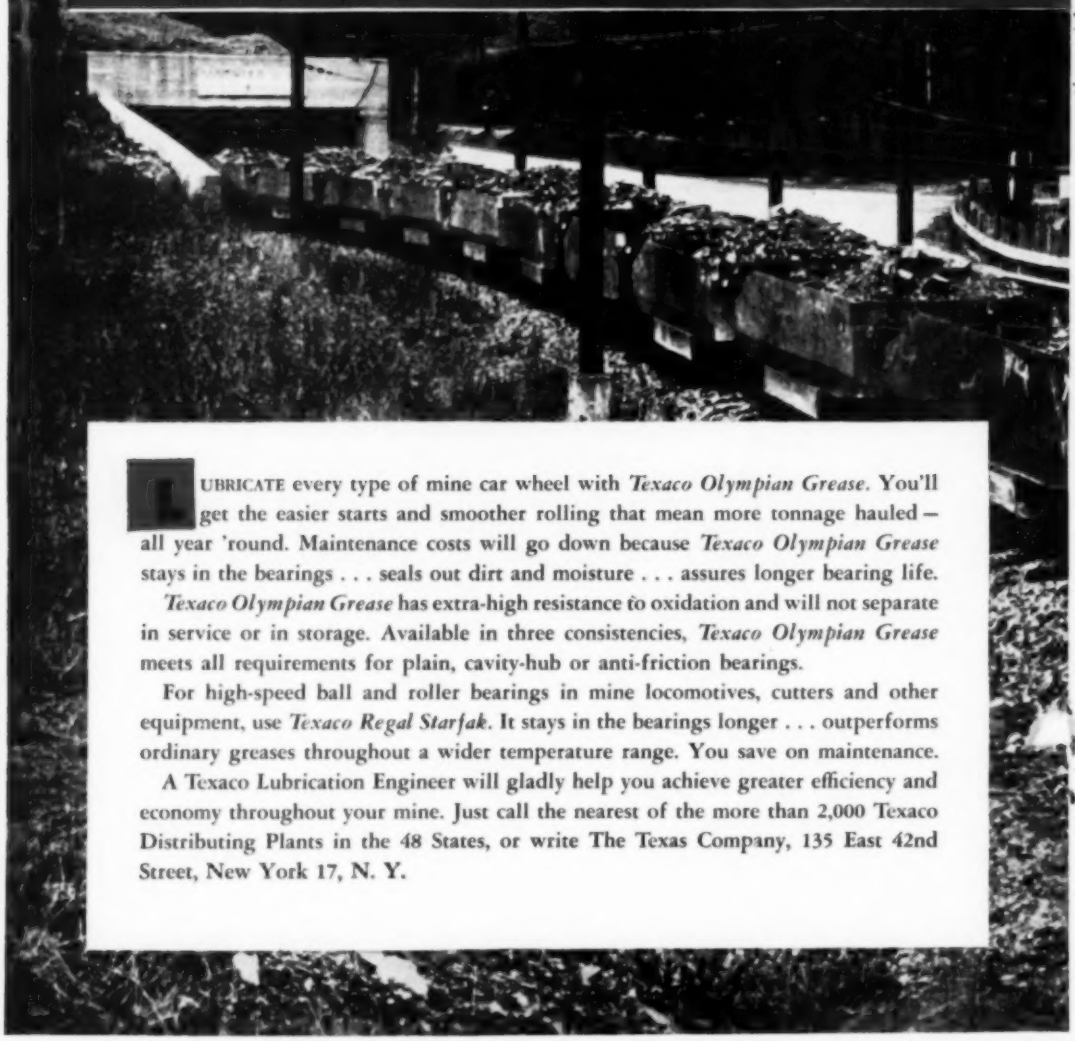
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on television —
the TEXACO STAR THEATER
starring MILTON BERLE.

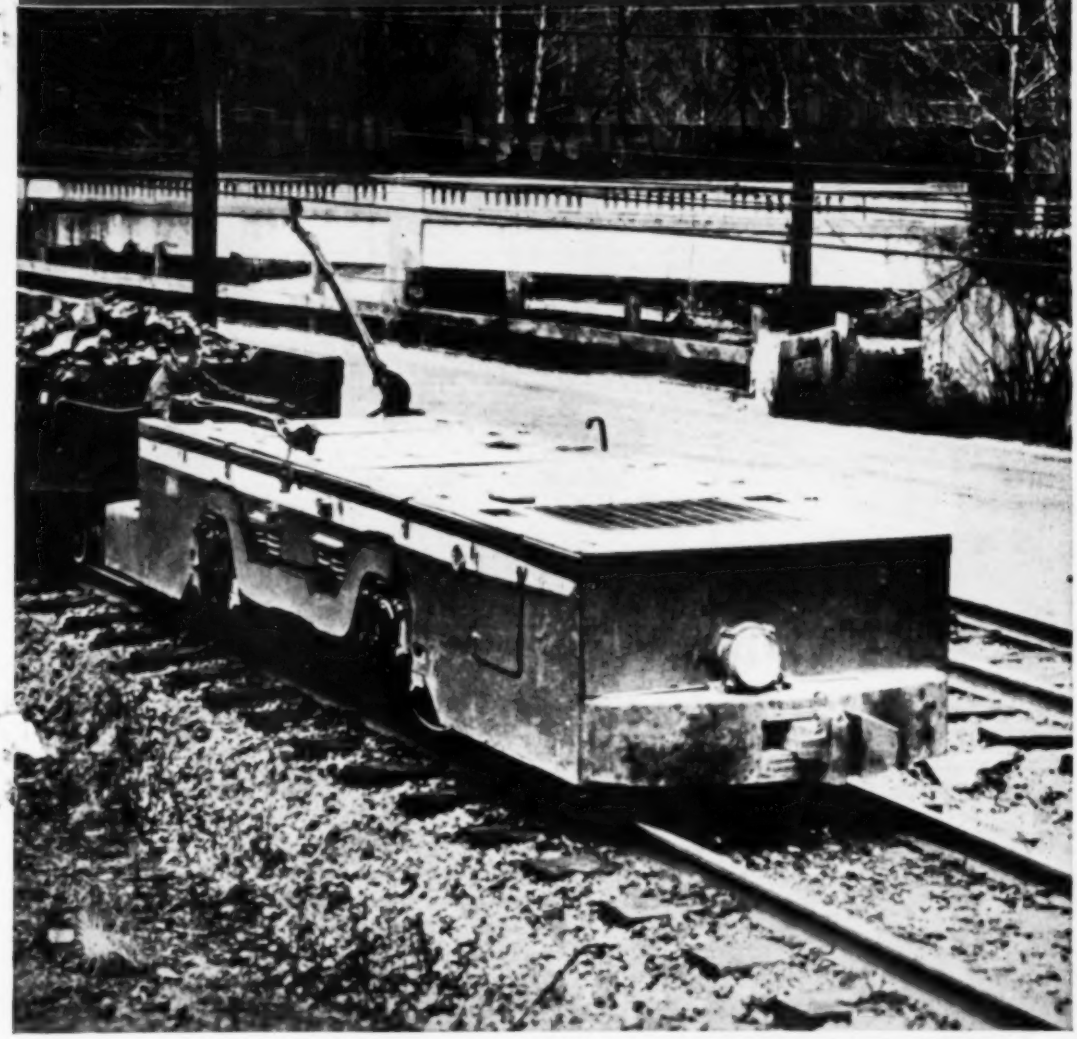
See newspaper for
time and station.

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TEXACO LUBRICANTS

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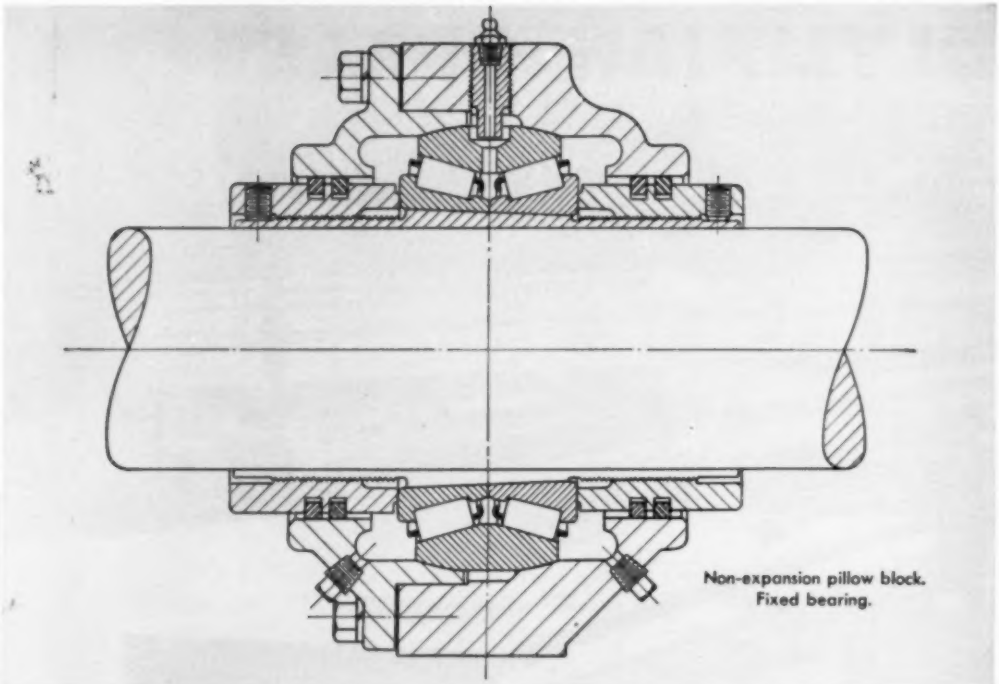
OLYMPIAN GREASE



For the Coal Mining Industry

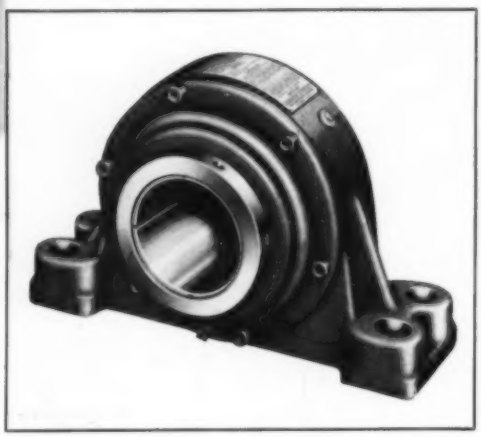
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NEW TIMKEN® ROLLER



Non-expansion pillow block.
Fixed bearing.

First application of new tapered makes new Dodge-Timken®

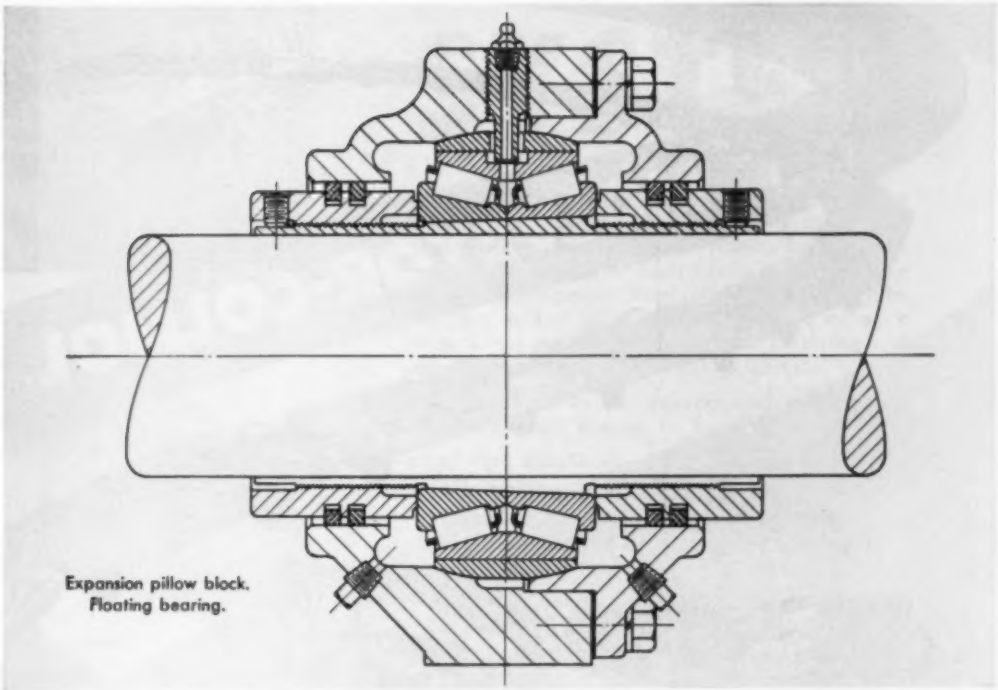


IT takes up less space. It weighs less. Yet the new Dodge-Timken® All-Steel pillow block has tremendous load-carrying capacity.

It's the result of the combined achievements of the Dodge Manufacturing Corporation, Mishawaka, Ind., and The Timken Roller Bearing Company and makes use of an entirely new Timken bearing. Never before has a self-aligning, non-adjustable tapered roller bearing with tapered bore been used in pillow blocks.

Being of all-steel construction, this new Dodge-Timken pillow block is more compact and fills a real need where space is a factor. It is available in both expansion and non-expansion designs. And it incorporates all the advantages of Timken tapered roller bearings.

BEARING PILLOW BLOCK



Expansion pillow block.
Floating bearing.

bore TIMKEN® bearing pillow block more compact

Because of their tapered construction, Timken bearings take radial and thrust loads in any combination. Line contact between rollers and races gives Timken bearings load-carrying capacity to spare. Timken bearings are made of the finest steel ever developed for tapered roller bearings—Timken fine alloy steel—and under normal conditions will last the life of the machinery with which the pillow blocks are used.

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This symbol on a product means its bearings are the best.

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TAPERED ROLLER BEARINGS



NOT JUST A BALL ○ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▭ BEARING TAKES RADIAL ◫ AND THRUST →◫← LOADS OR ANY COMBINATION

JEFFREY...

MOLVEYOR-COLMOL



309-52

96-51

The COLMOL is a continuous mining machine which advances into a solid seam, removing all coal from a minimum area 9½ feet wide by 3 feet high. All machines have a 12" adjustment for height and are available in different heights up to 72".

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Continuous MINING SYSTEM



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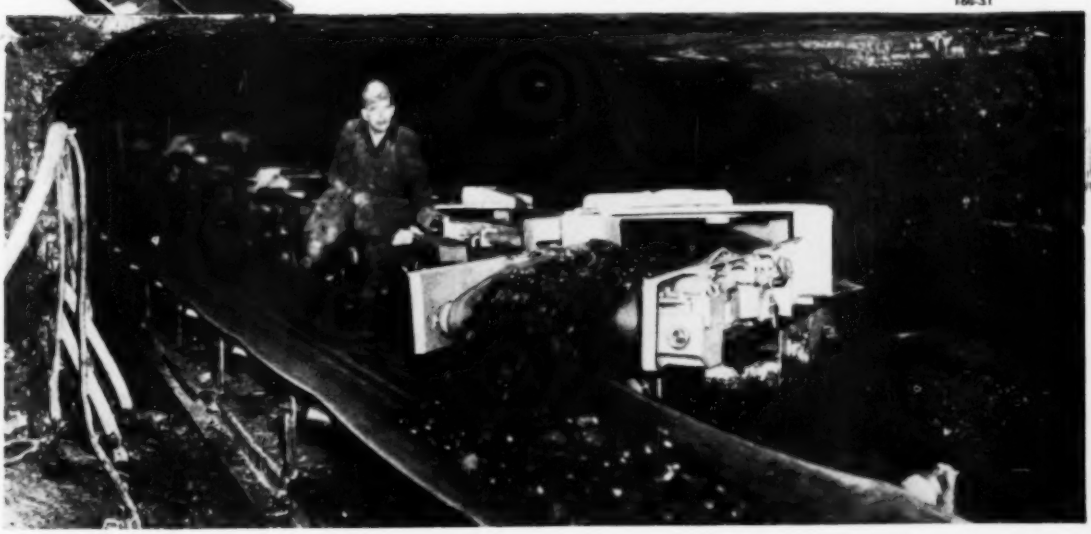
● The MOLVEYOR is comprised of receiving end section, a discharge end and any number of intermediate sections and provides a flexible high productive method of transporting coal from face to main haulageway. Receiving end section can be attached to COLMOL and designed to advance with it—or can be operated from receiving end when not connected with the COLMOL.

Discharge end section delivers coal continuously to belt haulage system.

15 foot Belt Section
Belt motors — 2 H.P.
Each unit has an ½ H.P. traction motor
Can be operated as a complete unit up to 350 feet — or longer
Tramming speed ..... 33 feet per minute
Belt width ..... 24 inches
Belt Speed ..... 300 or 400 feet per minute
Capacity ..... 3 or 4 tons per minute

Contact a Jeffrey Engineer relative to adaptation of this system to your mine.

166-51




New
MEDIUM-DUTY UNDERCUTTER BIT
CC-2 COAL-CUTTER BIT
FINGER BIT
SOLID ROOF-BOLTING DRILL
IMPROVED AUGER DRILL BIT
Specify
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THE QUALITY BRAND
OF COAL MINING TOOLS

Improved Auger Drill Bit

...mine-designed, mine-tested, mine-proved

Right from the mines comes the advanced design of this new, AD-30, 1⅞" dual-purpose, Improved Auger Drill Bit for blast-hole drilling and starter drilling for roof bolting.

Feeding pulverized coal more rapidly into the auger steel *without coal packing—even at the new high drilling speeds which are now possible*—is an outstanding *tested* and *proved* result of the mine-developed design of this new, Improved Auger Drill Bit.

And as another example in the Carboloy continuing program of advanced and improved design, the carbide tip contour has been altered and the entire shank heat-treated for additional strength in penetrating rock strata encountered in roof-bolting work.

Carbide Tools Help Cut Downtime

You can lower costs in your coal cutting by standardizing on carbide coal mining tools. And downtime is reduced all along the line when your miners are backed up by the *seven vital advantages* of carbide tools:

1. They cut more coal per shift than any others under equal conditions. **2.** Stay sharper far longer between grinds, eliminating a great per cent of the time wasted in bit changing . . . keeping costly machinery working more of the time . . . reducing equipment and labor costs per ton . . . boosting production per man. **3.** Provide longest possible tool life. **4.** Take more regrinds per tool. **5.** They are more efficient, require less power. **6.** Make clean, shattering cuts, with less wear and tear on vital machinery. **7.** Require far less conditioning . . . are back at work quicker.

Technical Services Help Cut Over-all Costs

To make sure you get *all* the benefits built into Carboloy Coal Mining Tools, take advantage of these helpful, valuable Carboloy services:

1. Complete training course for your key personnel. It features instruction and demonstration in correct grinding practices, and special discussion with your men on cemented carbide use in relation to the most efficient carbide coal-mining practices under your specific setup.

2. The assistance and advice of qualified Carboloy Field Engineers and your local Carboloy distributor.

3. Plus clear, concise maintenance-instruction manual and catalog—No. CM-100E.

Check today with your nearest Carboloy distributor, or write us direct for catalog (CM-100E) and additional tool or service information.

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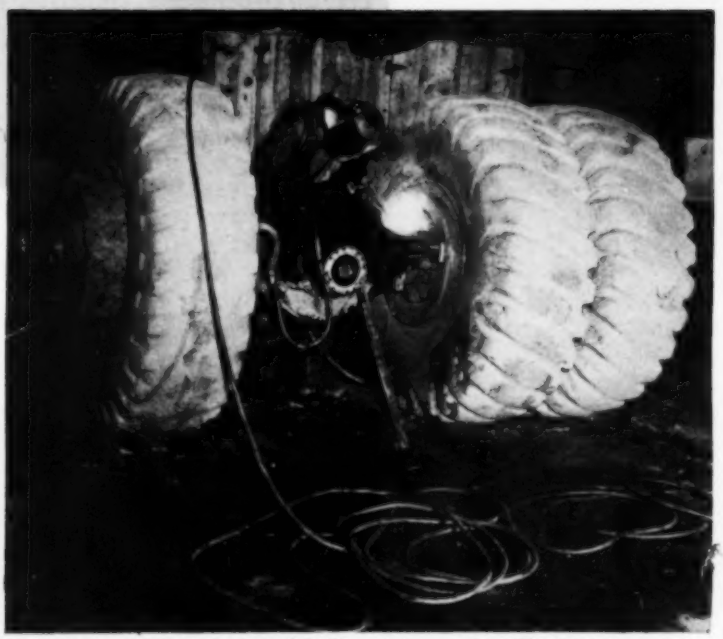
the rocks



NOTICE THE FLEXIBILITY of this No. 4, 5,000 volt AMERCLAD Cable. It contains a special crepe paper slipper applied over the conductors to permit easy bending.



HERE ARE the drills that punch out thousands of feet of holes every day. Notice how easily the cable can be coiled around the take-up reels.



THIS AMERCLAD WELDING CABLE is used at the maintenance shop. The 2/0 375 amp. cable is made up of 3,325 individual wires to provide super-flexible operation and ease the strain on the operator's wrists.

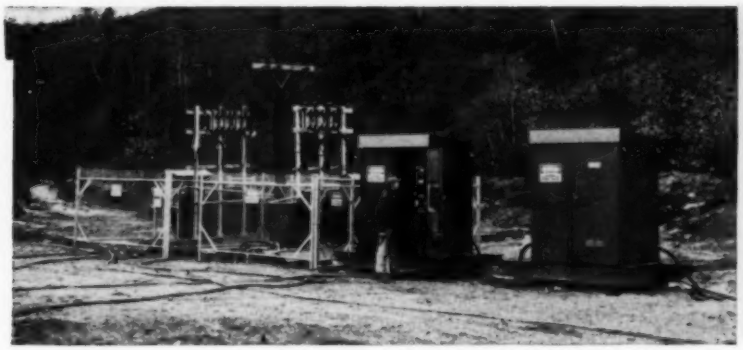
A STANDARD Cable for every

- ▶ paper & varnished cambric cables
- ▶ asbestos cords and cables
- ▶ aerial, underground & submarine cables
- ▶ shovel & dredge cables

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USS
AMERICAN ELECTRICAL WIRE AND CABLE
UNITED STATES STEEL

U·S·S AMERICAN ELECTRICAL

get so hot you can't touch them
but Amerclad
withstands the heat



THESE ARE TYPICAL switch houses and portable substation at the mine. Average length of cable used is 2,500 feet. The company has been using the original AMERCLAD for 7 years.

ONE of the nation's leading coal producers is stripping an area that is honeycombed with old mines. Many of these mines are burning, some for as long as 20 years. The rocks get so hot that you cannot walk on them or touch them, but miles of U·S·S AMERCLAD lie on the blistering rock without damage. Naturally, the mine operators try to protect the cable, but a lot of it has to lie on the ground.

This mine uses about 11 miles of AMERCLAD heavy-duty portable cable for power shovels and drills. The cable is unavoidably pulled over razor-sharp rock, soaked in acid water and exposed to the direct rays of the sun. In addition, thousands of yards of dirt and rock are blasted every day, and a lot of it comes down hard on the cable.

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☐ Have representative call.

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Title.....
Company.....
Address.....
City..... State.....

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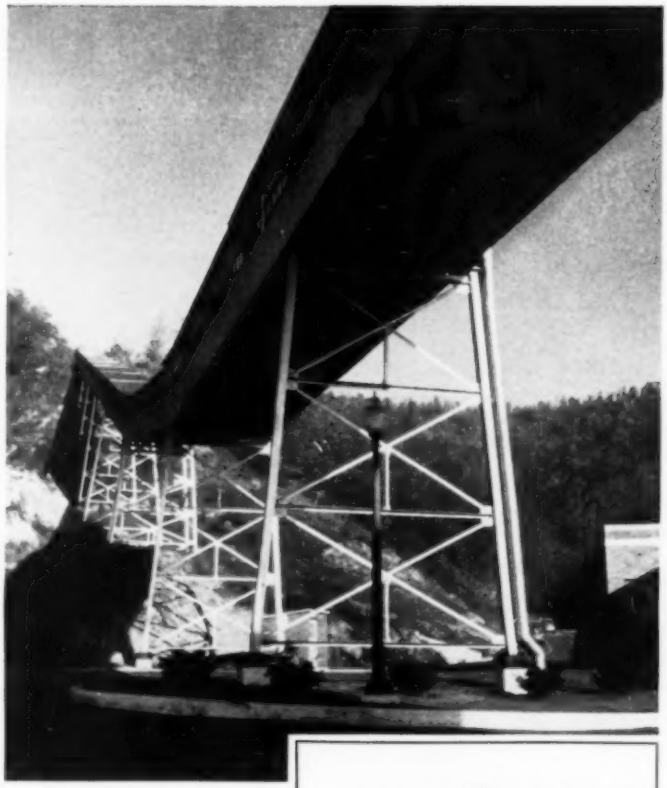
LINK-BELT engineering experience plus quality components combine to cut handling costs

Yes, in mines everywhere, Link-Belt is first choice in belt conveyors. Whether your job is large or small, Link-Belt can apply unequalled engineering experience to meet the conditions of your particular system.

Link-Belt builds a complete line of quality components. Our conveyor engineers can choose from all types and sizes of idlers, trippers and terminal machinery to match your exact requirements.

Link-Belt can also supply all related equipment — other types of conveyors, feeders, elevators, car dumpers and shakers. And Link-Belt will build your supporting structures and enclosures . . . install the job completely if desired.

Link-Belt will gladly work with your engineers or consultants. Get in touch with your nearest Link-Belt office.



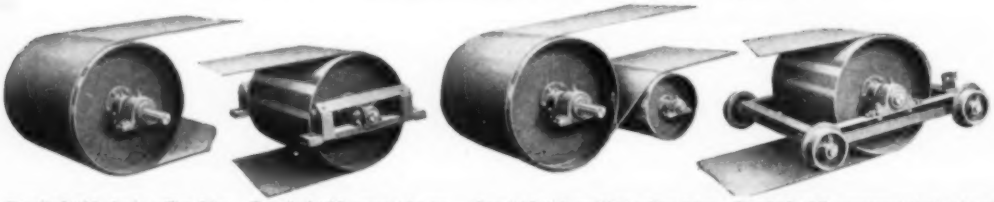
Over a street and up a mountain an enclosed Link-Belt 30 in. belt conveyor carries mine rock and washer refuse from Link-Belt-equipped coal preparation plant.

LINK-BELT BELT CONVEYOR EQUIPMENT

LINK-BELT COMPANY: Chicago 9, Philadelphia 40, Pittsburgh 13, Wilkes-Barre, Huntington 9, W. Va., Louisville 2, Denver 2, Kansas City 8, Mo., Cleveland 15, Indianapolis 6, Detroit 4, Birmingham 3, St. Louis 1, Salt Lake City 1, Seattle 4, Toronto 8, Springs (South Africa), Sydney (Australia).

12,767-A

LINK-BELT Pre-Selected Terminals—the right equipment for every requirement



Terminal with single pulley drive | Terminal with screw take-up | Terminal with snubbed pulley drive | Terminal with counterweighted take-up

Wilmot Offers Largest Choice of
RIVETLESS CHAIN CONVEYOR PARTS



Cut "Down" Time by depending on Wilmot for All Replacements

As the original manufacturers of Rivetless chain conveyors, Wilmot has been largely responsible for the many auxiliary parts that today give the equipment almost limitless applications. As a result Wilmot not only stocks the largest choice of chain sizes, but also furnishes the widest range of other conveyor parts.

Send for BULLETIN C-502



AS THE ORIGINATOR OF RIVETLESS CHAIN, WILMOT OFFERS A WEALTH OF PRODUCTION KNOW-HOW

Wilmot furnishes: -- Chain in pitches from 3" to 10½" and working loads from 3,000 to 130,000 lbs.; of drop forged alloy or cast chrome-manganese steels. Sprockets, traction wheels, flights, take-ups, shafting, bearings, casings and trough in cast iron, ductile iron, carbon or chrome-manganese steel. See how Wilmot's wealth of engineering and production know-how can solve your design and delivery problems.

CONTACT YOUR NEAREST WILMOT REPRESENTATIVE

BIRMINGHAM 4, ALA. -- Amos A. Culp, 930 Second Avenue, North

CHARLESTON 23, W. VA. -- Cross Pump & Equipment Co., P. O. Box 889

HAZLETON, PA. -- Wilmot Engineering Co., Markle Bank Building

KNOXVILLE, TENN. -- Crowell Engineering & Sales Co., 3045 Sutherland Ave.

PITTSBURGH 16, PA. -- Harold S. Lusk, 3045 West Liberty Avenue

ST. LOUIS 5, MO. -- Jack Van Horn, 7543 Cromwell Drive

NEW YORK 38, N. Y. -- International Manufacturing & Equipment Co. (export only), 220 Broadway

WILMOT ENGINEERING CO. HAZLETON, PA. *Plant:* WHITE HAVEN, PA.

NEW

ALL-STEEL

DODGE-TIMKEN PILLOW BLOCKS

Rugged! —FOR HEAVY DUTY SERVICE!

Compact! —LESS SPACE! LESS WEIGHT!

HERE are the bearings for industry's toughest jobs—in the most compact and rugged "package."

High radial and thrust capacities. Stamina to take heavy shock loads. All-steel construction that packs this load-carrying capacity into less weight and less space than ever before.

This brilliant achievement has been accomplished through pooling the engineering resources and bearing-building experience of Dodge and Timken. This new line so completely fills a need that engineers are already specifying "Dodge-Timken All-Steel" for some of America's heaviest machinery and largest industrial projects.

Completely assembled, permanently adjusted, lubricated and sealed at the factory, these All-Steel pillow blocks are shipped ready to go to work—wherever in industry the going is tough!

For detailed information and delivery dates write to Dodge, or call your Dodge Distributor.

DODGE

—of Mishawaka, Ind.

CALL THE TRANSMISSIONEER your local Dodge Distributor. Factory trained by Dodge, he can give you valuable assistance on new cost-saving methods. Look for his name under "Power Transmission Equipment" in your classified telephone directory.





A JOINT ENGINEERING DEVELOPMENT BY DODGE AND THE TIMKEN ROLLER BEARING COMPANY



SHAFT SIZES: $2^{15}/_{16}$ to 10 in.

- All-Steel construction
- A new Timken bearing design
- High radial and thrust capacities
- Compact—minimum dimensions
- Minimum weight; maximum strength
- Fully self-aligning with spherical outer race
- Both expansion and non-expansion types
- Adapter mounting, proven through the years
- Double piston ring seals
- Sealed both on and off the shaft
- Fully assembled, permanently adjusted, lubricated and sealed at the factory

DODGE MANUFACTURING CORPORATION, 3000 Union St., Mishawaka, Indiana



"Easy to load and unload!"

THAT's what Anthony J. Marsolino, owner of the Marsolino Coal Co., says about "Caterpillar" No. 80 Scrapers. He speaks from experience – he depends on "Cats" for profitable production. This one, with its matching D8 Tractor, is shown working on a stripping operation near Uniontown, Pa. On an 800-foot round-trip haul, it averaged 12 trips per hour. Average load – 24 to 25 yards – possible through use of sideboards. Total production per 8-hour day – 2,000 yards.

At the time this picture was taken, Mr. Marsolino planned to use three No. 80 Scrapers and D8s to move overburden from a 9-foot coal seam at Lisenring No. 2. "We will make use of their shovel-loading possibilities, too," he said.

"Caterpillar" No. 80 Scrapers are engineered for hurry-up production. Their cable operation permits pumping of dead material for faster loading. Their positive ejection gets rid of any material on the run. Their open bowl makes a big target for a shovel. And they've got the stamina to take a beating and stay on the job.

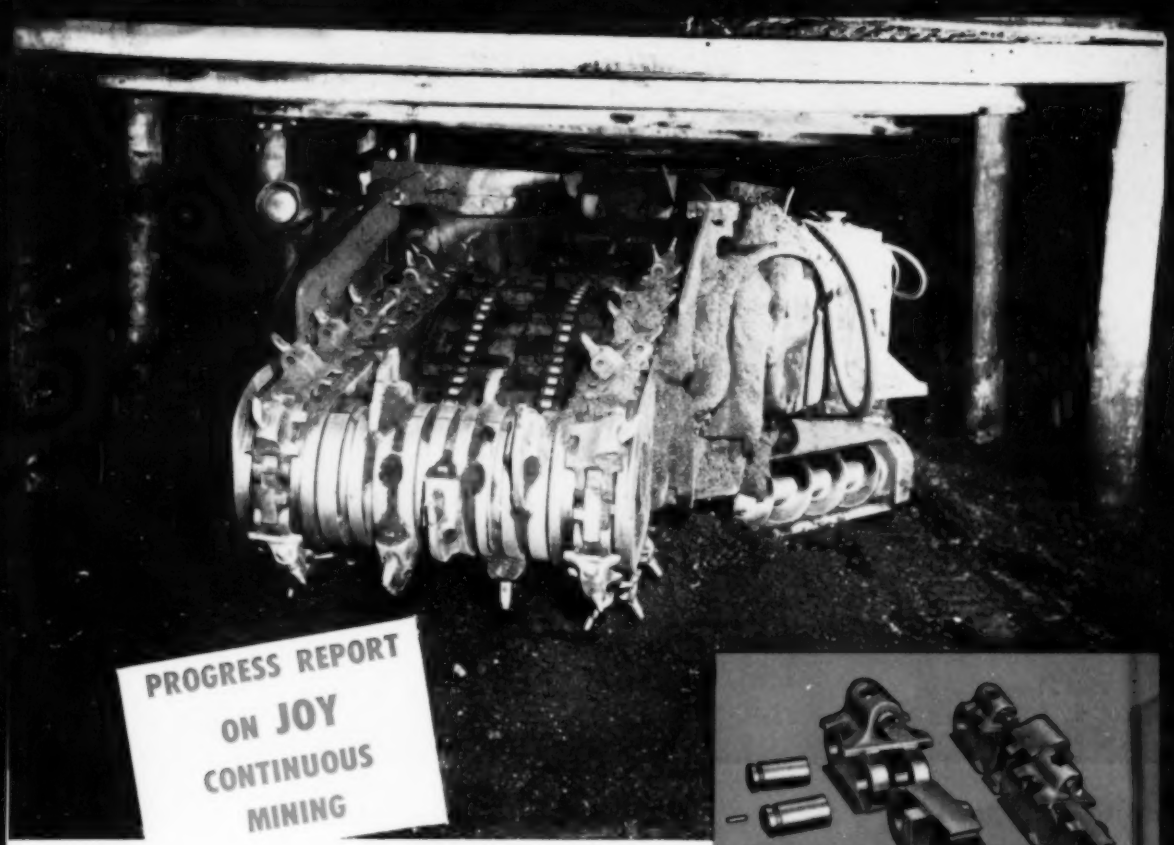
Your "Caterpillar" Dealer stands back of these fast workers with a genuine "Caterpillar" parts service that helps keep down-time to a minimum. Get the *facts* about their performance from him!

CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS

CATERPILLAR

REG. U. S. PAT. OFF.

DIESEL ENGINES
TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT



ROTARY DRUM HEAD HAS MANY ADVANTAGES

Rugged Construction–Low Maintenance

The rotary drum type of ripper head currently supplied on all Continuous Miners is a typical on-the-job JOY development, simplified in design and vastly improved in performance. It is rugged and compact, employing special alloy materials where required to assure operators of uninterrupted service with the least possible "down" time and consequent loss of production, and the maximum reduction in maintenance time and cost.

Reduced Power Consumption

Actual performance records from the many Continuous Miners with rotary drum heads operating in the field show that power requirements for the machine are reduced from 20 to 30% with this type of head. This is an important saving in itself, but in addition, there is less load throughout the drive, transmission and control units, resulting in other major improvements in overall machine performance and in maintenance and repair costs as well.

Longer Bit Life–Lower Cost

All the advantages of the rotary drum head have been secured without any sacrifice of tonnage. However, the yield of coal in sizes above 1" has been increased 50% or more, with an accompanying reduction of 20 to 25% in the sizes below ½". And not only has the number of bits used in the rotary head been reduced to about half those used in the original 6-chain cutter head, but bit life has been increased two or threefold. Overall head maintenance with the Joy Rotary Drum design has actually been reduced 40 to 50%.



Driving chain for the Rotary Head Continuous Mine . . . rugged and simple, developed specifically for its purpose —not a modification or makeshift.

Heavy duty Sulmet Bits used in the Rotary Head, designed both for maximum life and improved size consists, reducing the yield of coal in the smaller sizes.

JOY MANUFACTURING COMPANY, OLIVER BUILDING, PITTSBURGH 22, PA.

In Canada: Joy Manufacturing Company (Canada) Limited, Galt, Ontario

JOY

WORLD'S LARGEST MANUFACTURER OF UNDERGROUND MINING EQUIPMENT

WSD CL 4381

Here's your Field-Proved, Mobile



20-BU-I LOADER

Only 24" high, yet can load up to 8 tons per minute. Fast tramming, easily maneuverable, features independently driven conveyor and gathering head. While a shuttle car is away, the gathering arms can provide a fully-loaded conveyor ready for quick loading when the car returns. Also permits continued loading even if the gathering arms are momentarily stalled with hard digging.



8-SC SHUTTLE CAR

Features 4-wheel positive drive, 4-wheel hydraulic steering, tapered-end design for minimum turning clearance, height of only 26" and level capacity of 2 tons. Separate motors for traction, conveyor drive, and hydraulic pump drive. Disc-type brakes on all wheels, hydraulic cable reel and hydraulically-adjustable elevating discharge.

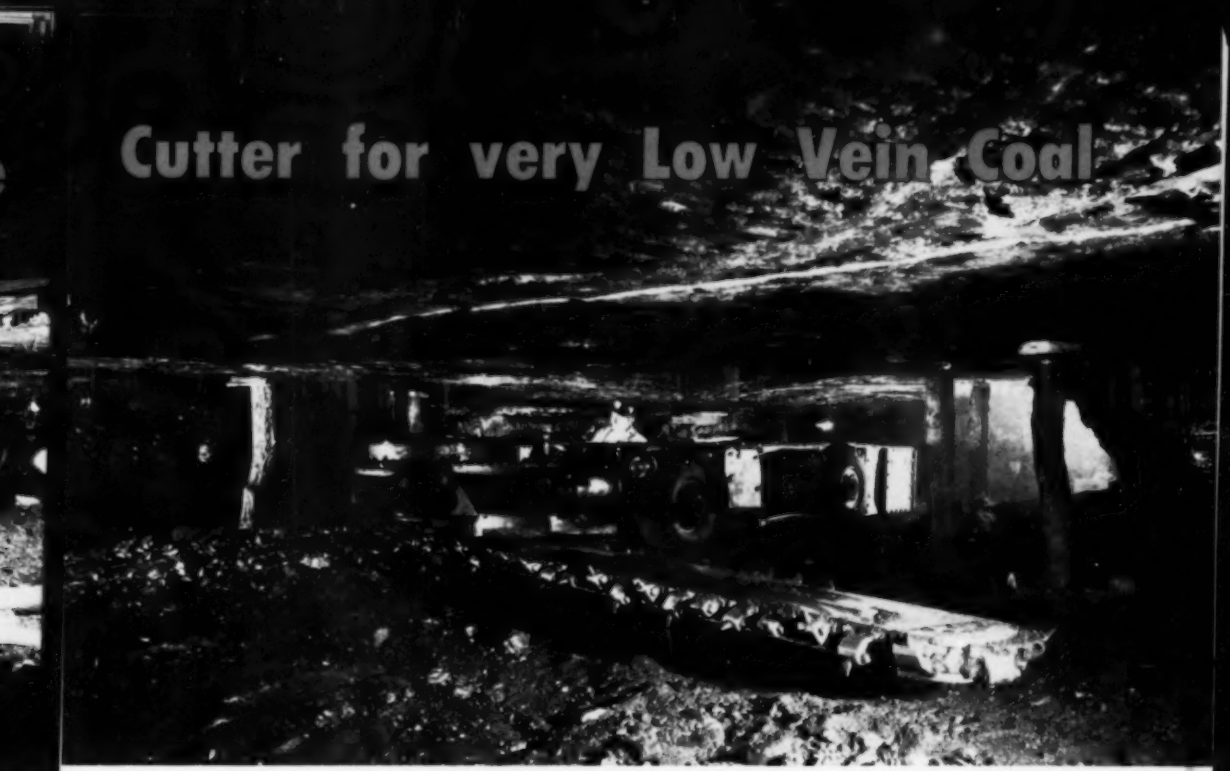
and here's the rest of the **JOY**

LOW VEIN TEAM

SULMET CARBIDE BITS

Joy Sulmet Bits, tipped with sintered tungsten carbide inserts, are made in a variety of types and different degrees of hardness to meet any mining condition. They fit any cutter, and by actual case records, out-perform every other bit on the market.





The JOY 12-RB CUTTER

Have you seen this film?

"TRACKLESS MINING IN COAL"

16MM—Sound and Full Color—45 Minutes

Write for a FREE Showing

Address our Film Booking Office

FAST TRAMMING, FAST CUTTING for HIGH PRODUCTION

Meet the JOY 12-RB, above . . . the cutter member of the *only* mechanized mining team designed specifically for high-capacity production in very low vein coal. With the Joy 20-BU-1 Loader and 8-SC Shuttle Car, it assures field-proved flexibility and economy never before available to mines operating in extremely thin seams.

The 12-RB is a highly mobile and maneuverable rubber-tired cutting machine only 26" high, supplied either as a top or bottom cutter, and readily convertible. Its high tramming speed and variable hydraulic feed (which provides a greater cutting feed speed than shortwall machines) together permit cutting more places per shift. Bar tilt, roll and lift are hydraulically controlled, and steering is also hydraulic, with a separate motor serving the hydraulic pump.

Consult a Joy Engineer

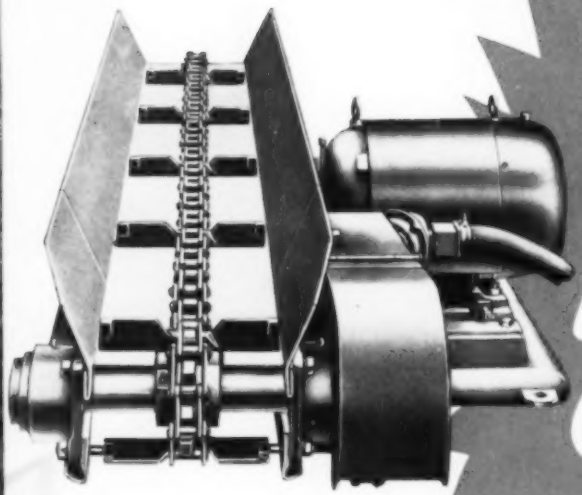


W&D CL-4001

JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING · PITTSBURGH 22, PA.

IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO



NO FLEXIBLE COUPLING



on the JOY FA CHAIN CONVEYOR!

The Joy FA Chain Conveyor is a completely modern, field-proved unit whose simple V-belt drive eliminates the costly flexible-coupling failures so common to conventional drives.

The FA drive is more compact, about 500 lbs. lighter, and much easier to move than conventional drives. It is unaffected by even substantial misalignment—the major cause of difficulty with flexible couplings.

A helical-and-spur gear reducer, considerably more efficient than conventional worm-gear reducers, is mounted directly in the discharge section. This permits a motor base approximately 4 sq. ft. smaller than conventional types.

You'll find the JOY FA is a real boon to efficient, productive conveyor mining. Full details are given in the Joy Bulletin No. LD-200, "A New Concept in Chain Conveyor Design". Write for it today!

Consult a Joy Engineer



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"Tycol Armitage boosts bearing life... smooths the way for faster, heavier loads"



Of course! Tycol Armitage Bearing Grease "stays put" ... keeps anti-friction bearings running smooth and cool. Its high stability makes it suitable for sealed anti-friction bearings that must last the life of the equipment.

Tycol Armitage possesses exceptional resistance to oxidation.

The dependable lubricating ability of this quality grease lengthens bearing life and cuts down maintenance costs.

Call your nearest Tide Water Associated office for further information.

TYCOL

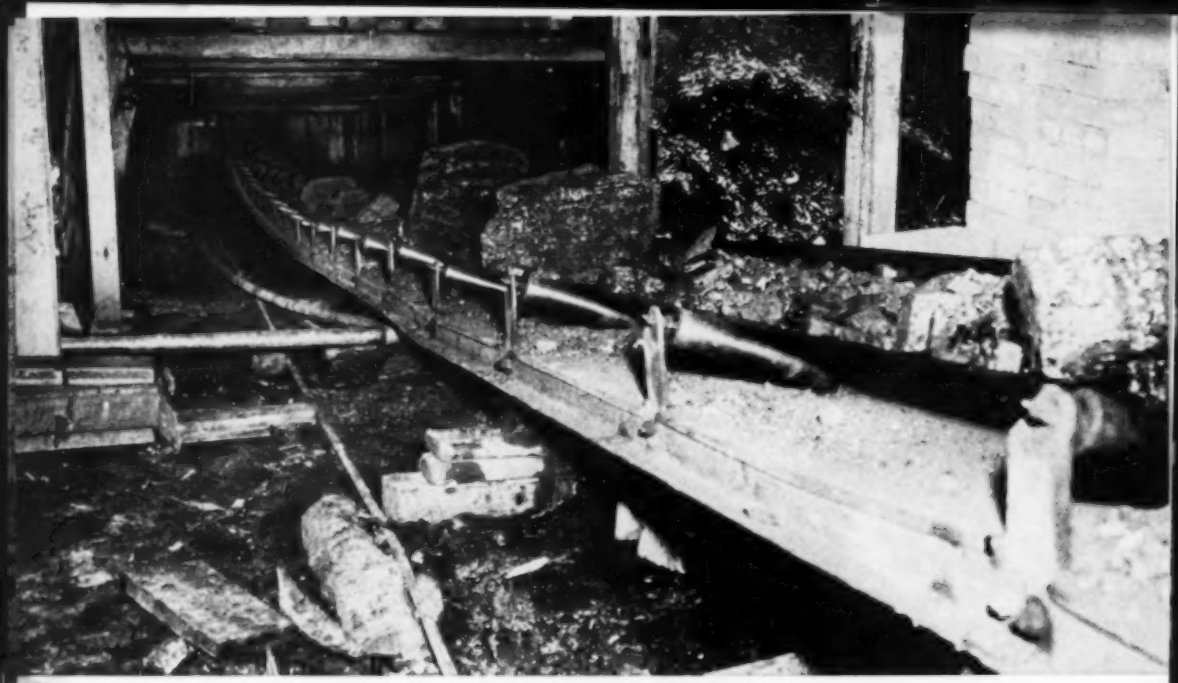
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Imperial Smokeless Coal Company finds . . .

Belt reinforced with "Cordura" rayon is thinner . . . stronger . . . trains better

Stronger and more flexible, because it's reinforced with Du Pont "Cordura", the belt at the tipple of Imperial Smokeless Coal Company's #2 Mine moves coal up a 17-degree slope at a speed of 150 feet per minute and carries 200 tons per hour. The belt has given trouble-free service and has not stretched enough to be noticeable.



Engineers of Imperial Smokeless Coal Company's #2 Mine at Carl, West Virginia, report that the 30" slope belt shown above withstands sudden surge loads of 3 tons or more, and resists damp conditions with which they must contend. The belt has given trouble-free service since its installation. It was manufactured by Goodyear Tire & Rubber Company on a carcass of Du Pont Cordura* High Tenacity Rayon.

Why have these engineers, like so many others, found that belts reinforced with "Cordura" train better? Here's the reason. "Cordura" rayon yarn is stronger than yarn of natural fibers. This permits a thinner belt, with fewer plies. *Greater strength with less bulk.* These thinner belts are naturally more flexible, sit more snugly on the center idler—and thus have better troughability.

And "Cordura" has the added advantage of making the belt relatively stretch-free.

Find out about conveyor belts reinforced with "Cordura". We'll be glad to send you the names of suppliers . . . together with full information about "Cordura" rayon yarn. Just send the coupon for your FREE booklet, "Sinews for Industry." Address: Textile Fibers Dept., Room 4421-C-5, E.I. du Pont de Nemours & Co. (Inc.), Wilmington 98, Delaware.

*REG. U.S. PAT. OFF.

Du Pont "Cordura" High Tenacity Rayon

STRENGTH AT LOW COST

DU PONT

150th Anniversary

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

HERE'S YOUR ANSWER TO MILDEW—

No. 1 enemy of conveyor belts



WHY does a conveyor belt develop soft, circular "mushy spots" and lose fastener holding strength? It's "cancer"—mildew-caused rot of the tension member of the belt, as the G.T.M.—Goodyear Technical Man—proved *conclusively* three decades ago.

The G.T.M. can show you that mildew—aided by darkness, intermittent belt use, dampness, lack of ventilation and uniform moderate temperatures—is a major cause of premature conveyor belt failure. *But not with Goodyear* belts!

Completely Mildew-Inhibited

An exclusive treatment—developed by the G.T.M. and proved by almost 30 years' service in thousands of belt installations—effectively inhibits Goodyear Conveyor Belts against attack from every type of mildew. It is one more reason why more tons, the world over, are carried on Goodyear Conveyor Belts than on any other kind—and why Goodyear belts give longer, more trouble-free, lower-cost service.

It will pay you to ask the G.T.M. for the full mildew story. You can get in touch with him through your nearest Goodyear Distributor, or by writing Goodyear, Akron 16, Ohio.



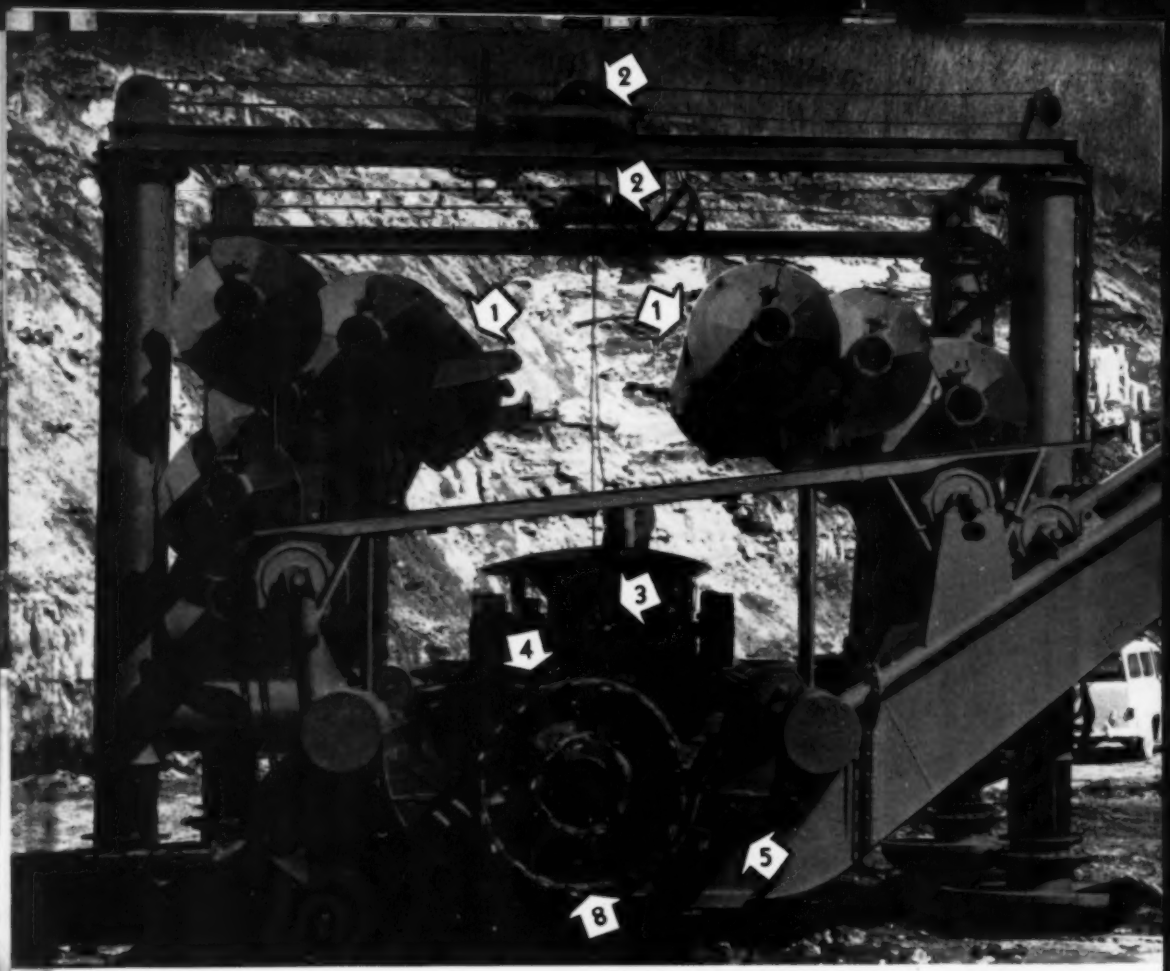
Close-up of mildew-affected section of conveyor failure. Note incipient crescent-shaped breaks and corona marking mildew growth, both clearly visible after removal of belt cover.

LOOK FOR YOUR NEAREST GOODYEAR INDUSTRIAL RUBBER PRODUCTS DISTRIBUTOR *in the yellow pages of your Telephone Directory under "Rubber Products" or "Rubber Goods." He handles Hose, Flat Belts, V-Belts, Molded Goods, Packing, Tank Lining, Rubber-Covered Rolls built to the world's highest standard of quality.*

GOODYEAR

THE GREATEST NAME IN RUBBER

Goodyear—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio



COMPTON

The first complete, self contained

COAL AUGER



From the outset, racks for storage of additional auger sections, loading conveyor, and all functional units of the COMPTON Auger have been self-contained and integral parts of the machine. Hence, when you move to another place, you are immediately ready to begin operating—no extra units to move—no loose parts to be handled.

Hydraulic control of Auger positioning—Auger sections (1) are conveniently racked at each side of frame ready for easy transfer to operating position by hydraulically controlled winches (2). The front and rear winches are synchronized and men merely attach winch hooks (3) to auger sections as required. The hydraulic winches lift and locate each auger section into operating position (4) in a matter of seconds thus eliminating operator fatigue. Individual hydraulic control of each winch facilitates positioning of each auger section. Hence, the hydraulically controlled handling of auger sections saves both labor and time.

Another COMPTON feature is the hydraulically operated pilot pan (5) which occupies the space between the machine and high wall and eliminates spillage at this point.

The COMPTON elevating conveyor (6), an integral part of the machine, also has a hydraulically controlled, swivelling discharge turret chute (7) which assures uniform trimming of trucks.

Here, then, is a sturdy, compact coal auger using COMPTON patented, nonclogging, lump recovery auger heads (8) and capable of producing up to 500 tons per shift of clean coal.

If you are interested in greater profits from your stripping operations, consult a Compton Engineer for details on the advantages of Compton Augers for high wall coal recovery.

COMPTON, Inc. ORIGINATORS OF COMPTON LUMP RECOVERY HEAD

Box 1946—Phone 4-6384 **CLARKSBURG, W. VA.**


Minestarter
PAIRED FOR PRODUCTION
Life-Line motor
DO NOT LUBRICATE

Dependability...

wrapped in explosion-proof construction

Here's an explosion-proof team that has the inherent dependability so important to today's mining operations. There's no time to pamper motors and controls. After installation, they have to stand on their own feet. These Life-Line motors and Minestarters have been establishing such a record for many years. They're built to meet Bureau of Mines standards.

Look at this Life-Line SK d-c motor.

Its pre-lubricated double-sealed bearings need no lubrication. The bearings are sealed, too—no chance for grit or dirt to enter and cause bearing wear. The heavy all-steel frame and feet add extra mechanical strength—stand up to the daily abuses encountered in many mine locations.

What about the Minestarter?

Its design provides continuous operation. Magnetic blowouts on the magnetic contactor quickly confine, divide and extinguish the arc—minimize burnout of contact tips. Contacts operate with a rolling action—confine arcing to the tips of the contacts. Thermal overload relay lags on short high-current peak during starting—acts instantaneously when overload can cause damage.

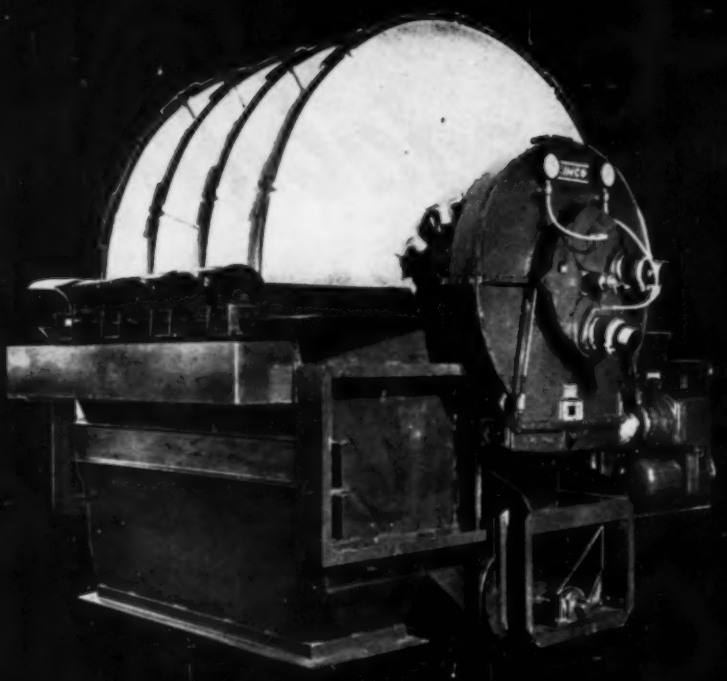
Talk it over with your Westinghouse representative. Ask him for a specific recommendation to meet your problem. Or, write direct to Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-21650

YOU CAN BE SURE... IF IT'S

Westinghouse

MOTORS and CONTROLS

SAVE COAL FINES WITH EIMCO AGIDISCS



Saving coal fines will add to your profits. Eimco Agidisc Filters used for dewatering of fine coals assures fast separation of the coal fines from the wash water, efficient drying and maximum production per square foot of filter area.

Eimco filters are heavy-duty machines, built for long continuous service with a minimum of attention. Experience in machine design for better processing performance has been gained through more than half a century of service to the processing industries. These factors make it easy for Eimco to build you a better filter. Let Eimco explain the use of this simple, efficient machine that will quickly pay for itself in product saved.

You Can't Beat an Eimco

EIMCO A397

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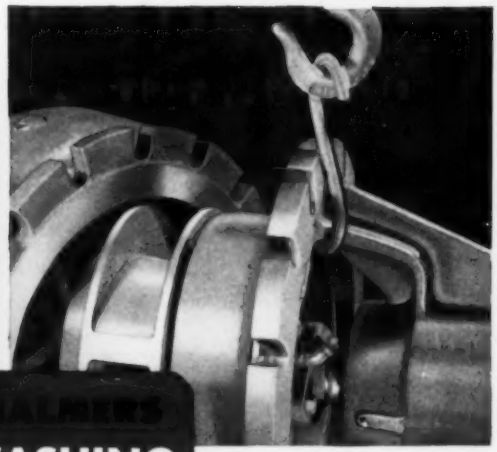
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QUICK, EASY DISASSEMBLY MEANS

Low Service Cost





1. Disconnect drive, loosen casing bolts and lift bolt assembly from slot. Bolt, nut and washers are still connected for easy reassembly.

ALLIS-CHALMERS
COAL WASHING PUMP

2. Swing out rotating element. Neither suction nor discharge piping is disturbed. All wearing parts are fully accessible for inspection or servicing.

Back in Service in less than a Half Hour

ALLIS-CHALMERS
Coal Washing Pump



Only 5 Wearing Parts

Shaft sleeve, impeller, casing, two wear plates. All easy to handle and easy to replace.

YOU CAN SEE for yourself how quick and easy it is to service an Allis-Chalmers Coal Washing Pump. Fast servicing like this plus long runs between servicing keeps your pumping costs low.

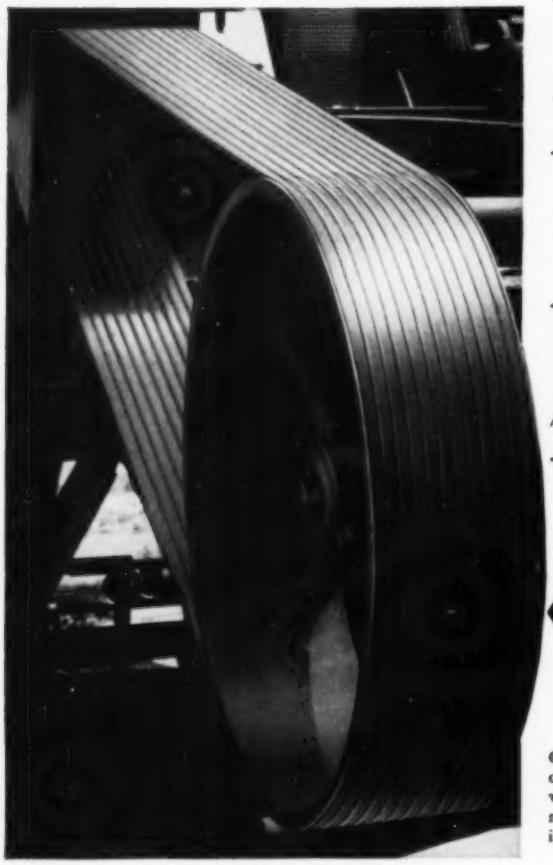
You get long life from Allis-Chalmers Coal Washing Pumps, too, because they are made of special hard *Allisite* alloy . . . because they have thick sections and heavy parts throughout . . . and because they are application engineered by specialists who know coal washing problems and how to solve them. Allis-Chalmers can supply the complete pumping unit — pump, motor, drive and control — of matched components from one reliable source with one guarantee of satisfaction.

Get complete information on Allis-Chalmers Coal Washing Pumps from your nearest Allis-Chalmers Authorized Distributor or District Office. Or write Allis-Chalmers, Milwaukee 1, Wisconsin, asking for Bulletin 08B6381. A-3783

Allisite is an Allis-Chalmers trademark.

ALLIS-CHALMERS A-C

How to Prevent Premature V-Belt Failure through Correct Installation!





DON'T pry V-Belts over edge of sheaves. (This can *injure* even the toughest belt structure.)



DO adjust take up by moving motor or by other means until belts can be placed on sheaves without pressure.



DO move motor back after belts are placed in grooves until tension is adequate and all belts are tight.

DO SPECIFY Bull Dog V-Belts

... their specially engineered cord section has high tensile strength designed for superior load carrying capacity, the ability to absorb shock loads and share the load equally.

Get the *complete* Bull Dog V-Belt quality story on covers, cords and compounds from your BWH distributor. And while you're about it, ask him about BWH power transmission belting, conveyor belting and hose. We're specialists in making mechanical rubber products work *better, longer!*

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BWH — DEPENDABLE RUGGEDNESS

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BOWDIL

TRADEMARK REGISTERED
U. S. PATENT OFFICE





The BOWDIL COMPANY

Designers, Manufacturers and Distributors of Cutter Bars, Chains and Bits • Rope Sockets • Coal Drills • Miners' Picks and Spike Pullers • Bronze Bushings • Sales Agents for Cincinnati Electric Drills

BOYLAN AVENUE S. E. • CANTON 7, OHIO

NO JOB TOO TOUGH...



Specially Designed by Wire Rope Specialists for Universal Dragline Service

Tuffy Draglines handle all kinds of material with equal efficiency. They are specially designed to fit all types of equipment . . . and to give longer service in digging, casting and loading operations. Mine owners choose Tuffy because of these features:

EXTRA FLEXIBILITY. Wires of the finest steel in a construction designed for universal dragline service, give Tuffy draglines the extra flexibility needed without sacrificing other qualities.

MAXIMUM ABRASIVE RESISTANCE. Obtained by finer technic in construction with materials toughened to withstand more abrasive wear.

EASY TO HANDLE. It's pliable. Tuffy Draglines spool better and ride better on grooves.

HUGS DRUM WHEN CASTING. Jerking, pulling and bending stresses do not distort its pliable construction.

STAMINA PROVED IN ALL OPERATIONS. Operating in dry dirt, wet dirt, sand, gravel, rock and minerals and on all types of equipment, Tuffy Draglines stand up under more days of service and move far more yardage than the best previous average obtained by many operators.

EASY TO ORDER, STOCK AND INSTALL. No confusing specifications. Just give (1) Size, (2) Length, and (3) the name, "Tuffy".

OTHER Tuffy's MADE FOR MINING



TUFFY MINING TEAM

Crab Motor Ropes, Winch Ropes — all Union-Formed (Preformed) designed to give maximum safety and service for specialized mining uses.

TUFFY SLUSHER ROPE Improved 3x19 gives maximum resistance to abrasion . . . is rigid, non-collapsing to eliminate drum crushing, yet elastic and flexible enough to take up shock loads.



TUFFY SLINGS

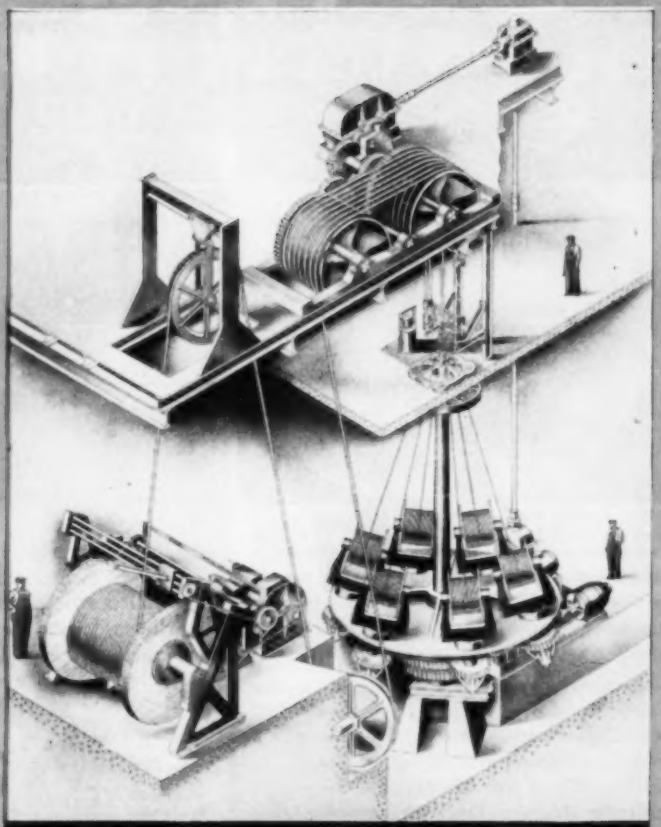
Patented interlaced wire fabric construction gives extra flexibility and stamina. Proof-tested to twice safe working load. Non-kinking. Non-crushing. 10 types.

union *Wire Rope* **corporation**

Specialists in Wire Rope

NO JOB TOO BIG . . .

for the makers of Tuffy® DRAGLINES



and other Wire Rope for Mining

Here's one of the few giants of the wire rope industry. It's Union Wire Rope's massive closing machine that stands 4 stories high . . . has capacity for laying rope from ¾" to 4" in diameter . . . can turn out 27 tons of wire rope in one continuous length.

This machine is a vital part of the specialized modern equipment used in Union Wire Rope's great plant to produce Tuffy Draglines, boom ropes, boom support ropes, hoist ropes, crowd and retract ropes, counterweight ropes, holding and closing ropes, and other special ropes for mining use.

See How Tuffy Can Help You Get Longer Service at Lower Cost

These factual, illustrated folders explain Tuffy construction . . . show how mine operators use Tuffy special mining ropes for maximum service and economy.

SEND FOR THESE FREE FOLDERS TODAY



UNION WIRE ROPE CORPORATION

2130 Manchester Ave. Kansas City 3, Mo.

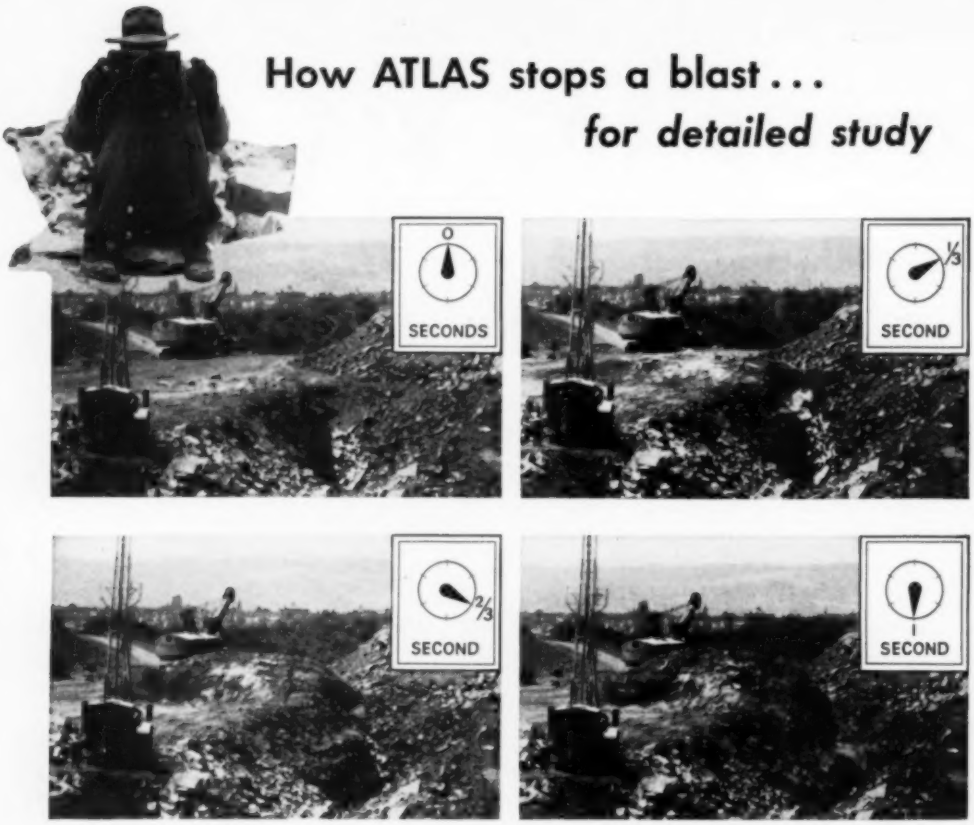
Please send information on: ☐ Draglines ☐ Slusher Ropes ☐ Slings
☐ Tuffy Scraper Rope ☐ Tuffy Dozer Rope

Name _____

Address _____

City _____ *Zone* _____ *State* _____

How ATLAS stops a blast . . .
for detailed study



From detonation until the dust settles, the Atlas machine-gun camera snaps photos at the rate of three per second. It sees all—shows all, with large size pictures that illustrate what really happens when a blast is shot.

The machine-gun camera pictures permit a step-by-step study of the blast. They show initial swell . . . the blast under way . . . the control of throw . . . fragmentation . . . and the final pile. Each blast that is recorded is studied for ways to constantly improve the effectiveness of the ROCKMASTER® blasting system on every type of job.

The machine-gun camera has recorded hundreds of blasts, putting a wealth of technical information at the disposal of your Atlas representative. Ask him to show you the picture presentation of the ROCKMASTER story. See for yourself how you may profit by using the correct numbers of the sixteen ROCKMASTER milli-second delay detonators teamed with the ROCKMASTER system of explosives choice and loading methods.

For details and photos of a similar ROCKMASTER *blast, send for this free booklet.*



ATLAS EXPLOSIVES

ATLAS

"Everything for Blasting"

ATLAS POWDER COMPANY • WILMINGTON 99, DELAWARE

Offices in principal cities

cut tonnage costs



with P&H ELECTRIC SHOVELS

In more and more locations these ultra-modern P&H machines are taking over the jobs that call for big production — steady digging. Users who know their cost accounting come back for more — for one proved reason . . . *lower tonnage costs.*

Contributing factors are these:

P&H Magnetorque* Hoist Drive powers hoisting motions electro-magnetically, gives you snappier dipper action — eliminates hoist generator, slip friction clutch and other troublesome mechanical devices.

P&H stepless power regulation is smooth and accurate — with no control fingers or contactors to give you trouble.

Independent propel, all-welded construction, filtered air cab and other modern refinements have led the way to more dependable production on a year-in, year-out basis.

If you seek lower tonnage costs in open pit work, let us tell you where you can see a P&H Electric Shovel in action. Ask about a P&H today.

*T.M. of Harnischfeger Corporation for electro-magnetic type clutch



Every third P&H Electric Shovel sold is a repeat order

HARNISCHFEGER CORPORATION

4400 West National Avenue • Milwaukee Wisconsin

POWER SHOVELS • CRAWLER AND TRUCK CRANES • OVERHEAD CRANES • ARC WELDERS AND ELECTRODES • SOIL STABILIZERS • DIESEL ENGINES • PRE-FABRICATED HOMES

Swing's the thing

WITH GOODMAN TRACTOR TREAD LOADERS

Type 865	Type 660	Type 665
26½" high	33" high	43" high



SWING OF LOADING HEAD

. . . 40° to either side of centerline.

Wide loading path with only forward and backward tramming.

Good cleanup, corners loaded out, close posting no handicap.

VERTICAL LIFT OF LOADING HEAD

. . . from below mine floor to well above.

Tight coal can be attacked at most desirable height.

All coal on irregular bottom loaded out without digging in.





SWING OF DISCHARGE END

. . . 40° to either side of centerline.

When combined with swing of loading head, crosscuts can be driven at 90° angles in confined areas without double handling of coal; pillars can be loaded with maximum recovery.

VERTICAL ADJUSTMENT OF DISCHARGE END

Can be raised or lowered for correct discharge height into conveyor or shuttle car.

Before you decide on any, see Goodman swing-motion loaders in action. They are winning new friends every day throughout the coal fields. Let us arrange a mine visit so you can see for yourself their many advantages.

Goodman MANUFACTURING COMPANY

HALSTED STREET at 48th • CHICAGO 9, ILLINOIS

Now . . .

SMOOTH, FAST WORK CYCLE

counts more than ever



and it's yours with the Bucyrus-Erie 38-B

Most Compared . . .

BUCYRUS ERIE

Most Preferred

SPEED is a traditional characteristic of Bucyrus-Erie excavators . . . and speed in the individual dig, swing and dump operations tells only part of the story.

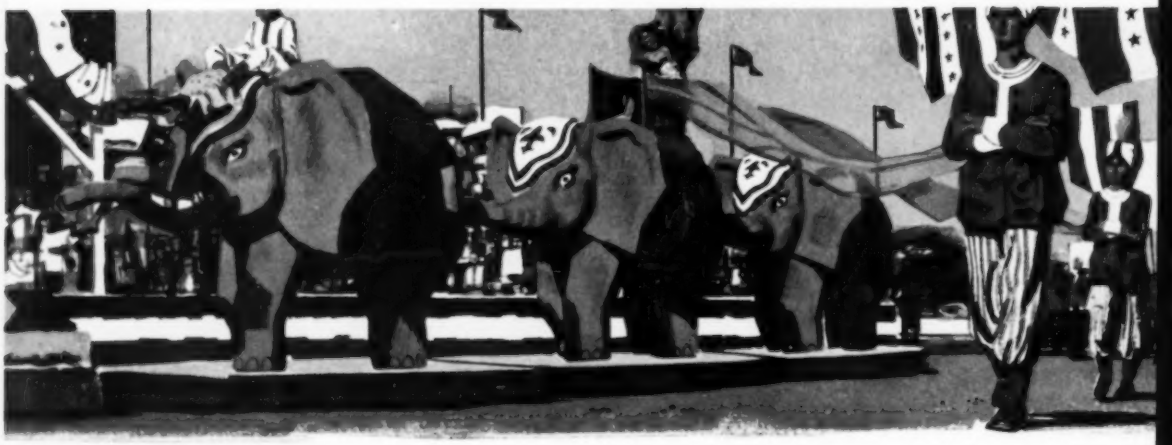
In the Bucyrus-Erie 38-B, working speed starts on the drawing board, where cycle functions are *balanced* with one another (as well as being designed fast in themselves) . . . and coordinated with proper weight distribution. Adding smooth, steady power . . . liberally used anti-friction bearings . . . easy-filling dippers . . . and direct-action mechanical control gives it the overall production speed that has made Bucyrus-Erie the standard of the industry.

Eliminating lost time and waste motion is one *big* way to boost coal production. Now . . . when that counts more than ever before, you can count on Bucyrus-Erie excavators to "deliver the goods." B&E52

BUCYRUS-ERIE CO., South Milwaukee, Wisconsin



This Bucyrus-Erie 38-B's special 2¼-yd. coal-loading dipper is just one of many features designed to help you move more coal . . . faster . . . and at lower cost.



Saluting Minneapolis and the 1952 Aquatennial, July 18 to 27. Spectacular parades . . . colorful water carnival . . . pulchritude galore are the order of the week. Above picture is inspired by an Aquatennial Kodachrome, furnished by the Minneapolis Chamber of Commerce.

markets for washed coal

wherever you go!

Minneapolis

FOR INSTANCE...

Reproduction of advertisement substantially as it appeared in Fortune.

Coal, a great source of energy in Minneapolis, must be shipped in. There's not a single coal mine within hundreds of miles. It's shipped from mines in Illinois, Indiana, Kentucky, Missouri, West Virginia, Ohio. Whatever state it comes from, much of it is bound to be washed in McNally Pittsburg modern coal washery plants.

Northern States Power Company's great Riverside Steam Plant, illustrated below, with capacity of 262,000 kw is a user of washed coal produced in many states, meeting exact specifications. Much of it is prepared in McNally Pittsburg washeries.

Other coal users in the Minneapolis area are also particular about the coal they buy. They know washed coal produces the highest Btu for their coal dollar. Coal merchants have discovered that it enables them to keep their customers enthusiastically satisfied. And homeowners can heat their homes comfortably at low cost.

A typical McNally Pittsburg coal washing plant, furnishing washed coal to the Minneapolis area, is illustrated in the large picture below. It is designed and equipped to produce premium fuel which is so beneficial for industrial user, coal merchant, homeowner . . . profitable and customer satisfying for coal operators.

Consult us for better methods to put your operations on a higher basis of performance to meet modern demands.



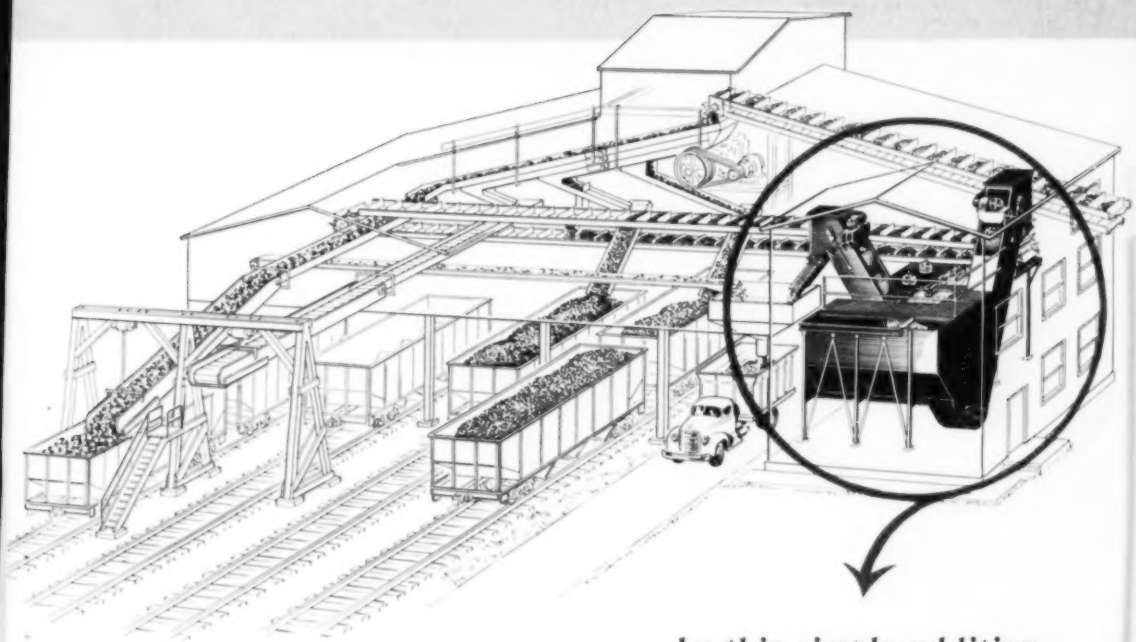
McNALLY PITTSBURG

MANUFACTURERS OF EQUIPMENT TO MAKE COAL A BETTER FUEL



Small or Large Coal Operating Plants

...THE ONLY DIFFERENCE IS *Volume*



The washed coal processed in the unit addition to your raw coal plant is the same premium quality as can be produced in the larger plants . . . the only difference is volume. The McNally unit washer handles coal from 5" x 0, in tonnages from 30 to 100 tph. It adds a washing section to your screening plant, and enables you to upgrade your coal without having to make a huge investment. Same washing principle. Baum Jig method of separation. Same automatic rejection features as the big plants. Washer and housing are offered in one package. When installed, you can then meet your customers' exacting specifications . . . your customers are completely satisfied . . . you can compete in any market where premium grades are wanted.

by this simple addition smaller operators can capture markets for

Washed Coal



Write for this "TELL HOW" Booklet

McNALLY PITTSBURG
MANUFACTURERS OF EQUIPMENT TO MAKE COAL A BETTER FUEL

McNally Pittsburg Manufacturing Corporation—Manufacturing Plants: Pittsburg, Kansas • Wellston, Ohio
Engineering & Sales Offices: Pittsburgh • Chicago • Rio de Janeiro • Pittsburg, Kansas • Wellston, Ohio

Walks away with tough payloads!

Pile on a capacity payload. Then watch a big, rugged International walk away with it!

The International for you is built to stand up through your toughest jobs, at less operating and maintenance cost. It's the result of the same engineering that has kept International the heavy-duty leader for 20 straight years.

That means you can expect consistently high performance and longer truck life plus greater comfort and easier handling.

There's more to tell, so why not see your International Dealer or Branch soon, and start saving money?

INTERNATIONAL HARVESTER COMPANY • CHICAGO

Look for these International exclusives:

- Powerful, dependable, economical gasoline, diesel or LPG power plants for rough, tough going.
- The "roomiest, most comfortable cab on the road"—the Comfo-Vision Cab. One-piece full vision windshield. New green tinted "Solex Duplate" glass available.
- Super-steering system—more positive control, easier handling and 37° turning angle.
- Extra heavy-duty engineered for your job, selected from the world's most complete line. 115 basic models, from ½-ton pickups to 70,000 lbs. GVW off-highway models.
- More than half the International Trucks ever built are still on the job.
- America's largest exclusive truck service organization.

International Harvester Builds McCormick Farm Equipment and Farmall Tractors
Motor Trucks . . . Industrial Power . . . Refrigerators and Freezers

Better Roads mean a better America

INTERNATIONAL TRUCKS

"Standard of the Highway"





Go Under the Overburden for NEW Profitable Coal Production

WHERE EXCESSIVE OVERBURDEN MAKES COST OF STRIPPING PROHIBITIVE, YOU CAN STILL RECOVER FROM 100' TO 120' OF THE COAL SEAM . . . . . PROFITABLY . . . WITH THE

CARDOX-HARDSOCG *Surface* AUGER MINER



Here a 145 HP AugerMiner drills into an exposed seam, bringing coal out to a mechanical loader for fast, efficient operation.

You can get this additional production from "dead" strip mines abandoned because overburden has become too heavy, too costly to remove. Use the Cardox-Hardsocg Surface AugerMiner to burrow into the already exposed seam and bring protable bonus tonnage out from *under* the overburden.

LOW-COST RECOVERY OF HIGH-GRADE COAL

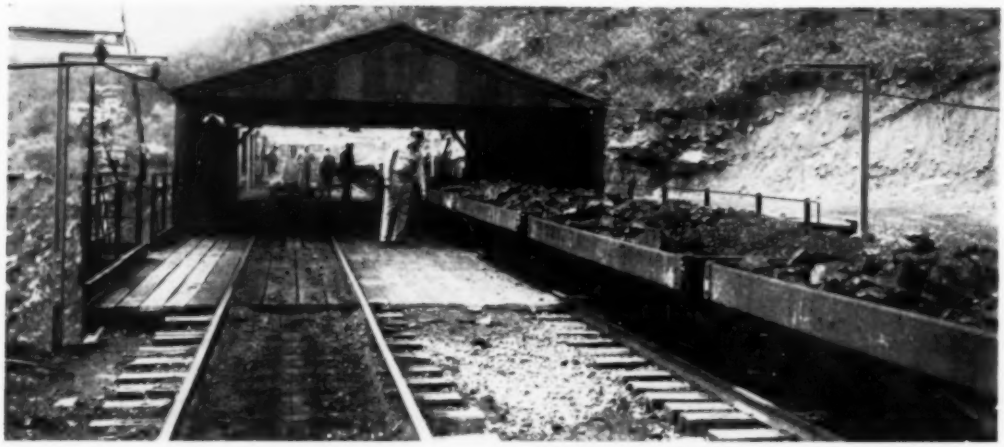
Mining cost is low because no new, expensive development is required — the seam has already been exposed by your stripping operation. Vertical direction control of the AugerMiner keeps it drilling in the seam, avoiding rock and shale, thus producing clean, high-grade coal — in sizes influenced by your choice of cutterhead.

SIMPLE TO SET UP AND OPERATE

The AugerMiner is trucked or towed on detachable wheels to the face of the seam, where its self-elevating posts place it at working height. Augers up to 40" in diameter are then connected in 6' sections to drill 100' or more into the seam. Auger sections are easily and quickly handled with the built-in hoist and retriever. AugerMiners are available in 95 and 145 HP models for all thicknesses and conditions of seam.

Find out more about this extra-dividend producer today. Ask your CARDOX Representative or write for new AugerMiner Bulletin.

HARDSOCG DIVISION
CARDOX CORPORATION [illegible] • [illegible]
BENTON, ILLINOIS • CAMDEN-ON-GAULEY, W. VA. • EVANSVILLE, INDIANA • HARPER, W. VA.
[illegible]



RED JACKET'S NO. 17...

ANOTHER MODERN MINE INSTALLS THE S-D AUTOMATIC HAULAGE SYSTEM FOR MORE EFFICIENT, ECONOMICAL OPERATION

RED JACKET

TRADE MARK REGISTERED

Red Jacket's Modern No. 17 Mine is another typical example of how modern mines are making a major reduction in coal production costs by installing the S-D Automatic Haulage System. At No. 17 this modern haulage system comprises three 15-ton locomotives, 250 S-D "Automatic" Drop Bottom Cars and a 450-ton capacity Surge Bin. Coal and slate cars are often mixed in the same trip of about 20 cars. An average haul from the mine to Surge Bin is about 3 miles.

DETAIL INFORMATION ON THE S-D HAULAG SYSTEM AT RED JACKET'S NO. 17 MIN

NO. OF S-D "AUTOMATIC" DROP BOTTOM CARS

200 16 foot (6-ton capacity) cars for transporting coal.
50 12 foot (4-ton capacity) cars for transporting slate.

Car Wheels: S-D "Floater" Ball Bearing
Method of Loading Cars: Mobile Loaders to Shuttle Cars to Elevating Conveyors to S-D "Automatics".)
Average Trip: 20 cars
Average Haul: 3 miles
Track Gauge: 48 inches
SURGE BIN CAPACITY: 450 tons
Construction: Concrete
Bin Length: 52 feet
Bin Width: 25 feet
Tracks Over Bin: Two (Bin loaded by trips entering from either direction.)

COAL HANDLED BY THE 250 S-D "AUTOMATICS" AND 450 TON CAPACITY SURGE BIN:
4,000 tons per day

As each trip approaches the Surge Bin the slate cars are independently emptied at a slate bin. Trip continues non-stop over Surge Bin, where coal cars are automatically emptied, then returns back to the mine. This fast, dumping-on-the-move haulage operation saves hundreds of man-hours by eliminating dumping labor. It saves thousands of dollars involved in maintaining expensive rotary dump equipment. It saves hundreds of hours in down-time because, in the S-D System, should a breakdown occur it is not necessary to shut down the whole system until repair is made. In addition, this system reduces mining and cleaning plant operation costs because it permits each to operate independently of the other. One shift operation of preparation plant is often sufficient to take care of two shift operation of mine. Any cleaning plant works at the least cost with an even continuous supply of coal. The Surge Bin continues to supply coal to preparation plant when, for any cause, there is a delay at the face. Breakdowns or delays at the preparation plant need not stop mine production because the Surge Bin will take the coal until repairs are made.

This continuous supply of coal from the face to the preparation plant, guaranteed by the S-D Automatic Haulage System, is absolutely necessary to produce coal at the lowest possible cost. This system is recognized as the leading method of cutting coal mining costs today! We welcome an inquiry from you. Sanford-Day Iron Works, Inc., Knoxville, Tennessee.

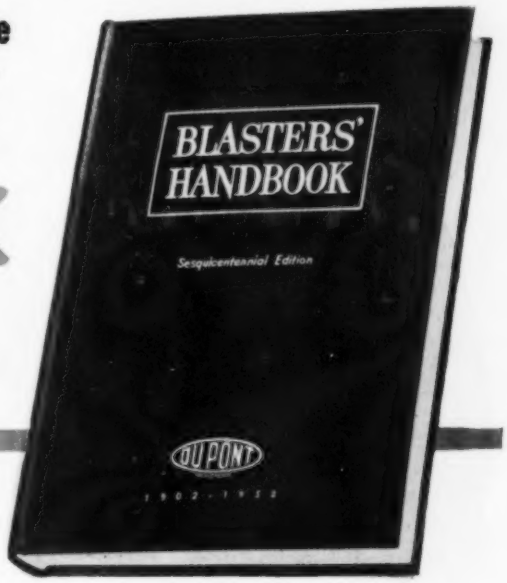
SANFORD-DAY IRON WORKS

DU PONT ANNOUNCES

The Sesquicentennial Edition of the

BLASTERS' HANDBOOK

COMPLETELY REVISED... COMPLETELY UP TO DATE!



THE SESQUICENTENNIAL EDITION . . .

of the Du Pont Blasters' Handbook is now available. Bigger and more helpful, the new book is filled with more information than ever before. It is fully illustrated with 33 chapters of basic information on blasting procedures that every user of explosives should have.

THIS BRAND-NEW BLASTERS' HANDBOOK . . .

is a complete and modern guide to better blasting. It describes preferred practices for all types of blasting jobs in all locations. Outlines industry-approved methods . . . provides reference charts and convenient tables. Completely new sections are devoted to new, improved products and their use, and to the newest developments in blasting techniques based on field experience. Contains an up-to-date and officially approved check list of safety measures.

HELPS YOU DO A BETTER, MORE EFFICIENT JOB

Blasters in every type of work will find this latest handbook a valuable aid. It answers many questions . . . helps you do a more satisfactory, more efficient job. Copies of this new, larger, and better edition of the Du Pont Blasters' Handbook may be obtained by mailing the handy coupon at right, or through the Du Pont Explosives representative in your own area. Price $1.75, postpaid. E. I. du Pont de Nemours & Co. (Inc.), Explosives Dept., Wilmington 98, Delaware.

CONTAINS

480 pages 240 illustrations
Much new subject matter
Larger type for easier reading

DU PONT
REG. U.S. PAT. OFF.

150th Anniversary

BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

E. I. du Pont de Nemours & Co. (Inc.)
Explosives Department, 2539-A Nemours Building
Wilmington 98, Delaware.

Gentlemen: I'd like to have a copy of the Sesquicentennial Edition of the Du Pont Blasters' Handbook. Enclosed is check ( ) . . . money order ( ) . . . for $_____. Please forward postpaid_____copies at $1.75 each.

Name _____

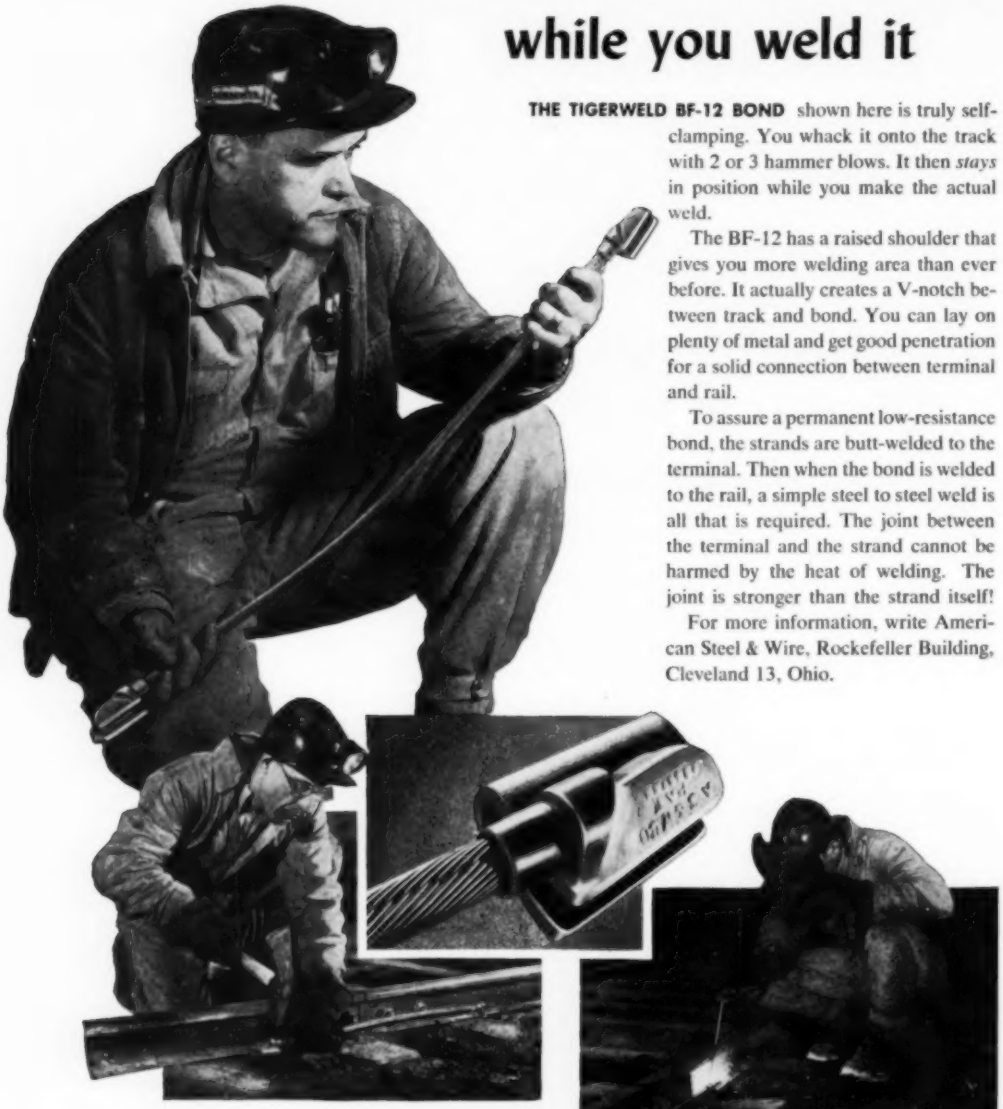
Company _____

Title _____

Street Address _____

City _____ Zone _____ State _____

This bond holds itself in position while you weld it



THE TIGERWELD BF-12 BOND shown here is truly self-clamping. You whack it onto the track with 2 or 3 hammer blows. It then *stays* in position while you make the actual weld.

The BF-12 has a raised shoulder that gives you more welding area than ever before. It actually creates a V-notch between track and bond. You can lay on plenty of metal and get good penetration for a solid connection between terminal and rail.

To assure a permanent low-resistance bond, the strands are butt-welded to the terminal. Then when the bond is welded to the rail, a simple steel to steel weld is all that is required. The joint between the terminal and the strand cannot be harmed by the heat of welding. The joint is stronger than the strand itself!

For more information, write American Steel & Wire, Rockefeller Building, Cleveland 13, Ohio.

AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL COMPANY, GENERAL OFFICES: CLEVELAND, OHIO

IN THE WEST—COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO · IN THE SOUTH—TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.

UNITED STATES STEEL EXPORT COMPANY, NEW YORK

U·S·S American Tigerweld Rail Bonds

UNITED STATES STEEL

THE IMPROVED

Exide-Ironclad

BATTERY

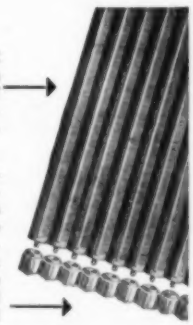
GIVES you more . . . SAVES you more

It gives you more of everything that adds up to top performance, long battery life . . . saves you more through low over-all costs. Outstanding new features, including the polyethylene insulating tube sealer, *more than ever before*, make Exide-Ironclad YOUR BEST POWER BUY . . . AT ANY PRICE.

HERE'S WHAT YOU GET

Rapid, high production haulage, more trips per shift . . . High maintained voltage, with uniform speed to end of shift . . . High availability . . . Low operating costs . . . Low maintenance costs . . . Low depreciation costs . . . Safety from hazards of fire and fumes.

AND HERE'S WHY



IMPROVED POSITIVE PLATE CONSTRUCTION. The long-life grids now contain SILVIUM—an alloy of silver, lead and other components—which makes them highly corrosion-resistant.

NEW POLYETHYLENE INSULATING TUBE SEALER of acid-proof, non-corroding plastic. It fits snugly into slotted tubes of positive plates, and reduces loss of active material. Even the small sediment deposit of the past is reduced 50%. Thus more active material remains available, and the high battery capacity is maintained for a longer working life.

PLUS THESE EXTRAS

IMPROVED NEGATIVE PLATES for higher electrical efficiency.

NEW SEALING COMPOUND provides permanent seal between jar and cover.

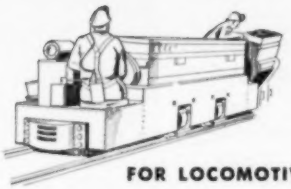
SEAMLESS SHOCK-PROOF JAR, of high-quality rubber. A scientifically selected combination of tensile strength and elongation provides a sturdy jar built for long-life and heavy-duty service.

NEW UNBREAKABLE PLASTIC VENT PLUGS of polyethylene.

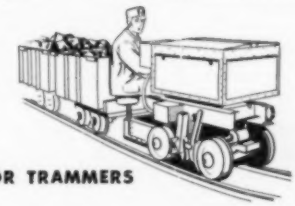
TYPES, SIZES AND CAPACITIES for battery-electric mine haulage units of every make.

THE ELECTRIC STORAGE BATTERY COMPANY
Philadelphia 2
Exide Batteries of Canada, Limited, Toronto

1888
DEPENDABLE BATTERIES FOR 64 YEARS
1952



FOR LOCOMOTIVES



FOR TRAMMERS



FOR SHUTTLE CARS

Exide-Ironclad
IS YOUR BEST POWER BUY
. . . AT ANY PRICE

POWER



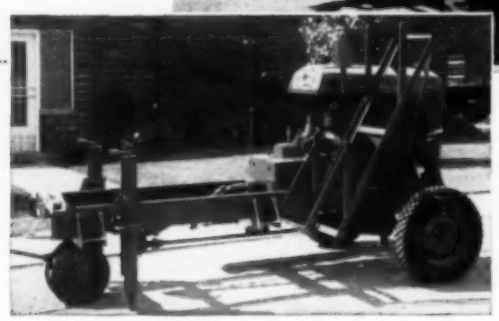
"EXIDE-IRONCLAD" and "SILVIUM" *Reg. T.M. U.S. Pat. Off.*

PARMANCO HI-SPEED HORIZONTAL DRILL

Completely Re-designed Around a 40 H.P. Engine

Drills a 6-inch Hole in two-thirds the ordinary time





Included in the new design is an auger rack which saves on drilling time. The augers are on the machine as it is moved from hole to hole. Another feature, for faster set up and smoother drilling, is the four individually adjustable leveling jacks. Automotive steering is optional.

This HI-SPEED DRILL is designed for drilling 5-6-8 in. holes to 100 ft. or more. The 40 h.p. engine with four drilling speeds makes possible the reduction of footage time by one third. This new drill, the very latest in design, is equipped with self starter and generator, dual type front wheels, truck type rear axle with hydraulic brakes and traction drive with both forward and reverse. Here is greater speed in retrieving augers and four rotating speeds and reverse for drilling and cleaning the hole. Here is accuracy and mobility. Here is the modern answer to faster, lower-cost drilling.

PARIS MANUFACTURING CO. PARIS ILLINOIS



Big lift for maintenance men...

● With its hundreds of belt idler bearings, this large coal conveyor at a midwest surface mine could have presented significant lubrication and maintenance problems. That's why mine officials, acting upon the suggestion of a Standard lubrication specialist, switched to STANOBAR Grease No. 2.

STANOBAR has dispensed easily from grease guns, thus providing a big lift for maintenance men. This has served to keep time and labor for applying lubricant at a minimum. There has been no trouble from hardening or caking of the grease in the bearings, nor has leakage been a problem. Effective lubrication has prevented any bearing failures due to excessive wear and has kept power requirements for starting and moving the conveyor belt at a minimum.

Operators of this mine have found STANOBAR entirely suited for bearing lubrication in other tipple equipment, such as shaker screens. This versatility has helped simplify lubrication from both stocking and application standpoints.

STANOBAR
TRADE MARK
Grease

The experience of this mine points to savings you can make through Standard's lubrication engineering service and high quality products. How you can get this lubrication service, quickly and easily, is explained at the right. Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.

What's YOUR problem?



H. Dillingham, of Standard Oil's Evansville, Indiana, office, is the Standard lubrication specialist who worked with this mine to find the right grease for a tough job. As a result of his work, the mine was able to save time and expense for the maintenance of a coal conveyor.

His on-the-job service is typical of that available to all midwest mines through a corps of such lubrication specialists. You can be sure that the specialist in your own area has both the practical experience and the training in a Standard Oil Lubrication Engineering School that will result in dependable, thorough assistance. To reach him, all you need do is phone your local Standard Oil Company Office. When he calls, be sure to discuss with him the benefits offered you by such products as:

STANOIL Industrial Oils—Simplify your lubrication jobs by using this *one* line of oils that provides cleaner operation of loader and crane hydraulic units, supplies effective lubrication in compressors, gear cases, and circulating systems.

SUPERLA Mine Lubricants—These new, improved oils and greases provide better lubrication of cutters, loaders, locomotives, mine cars, and other underground equipment. They eliminate transmission-case deposits, reduce clutch-plate gumming, and minimize wear on gears and bearings.

CALUMET Viscous Lubricants—On open gears and wire rope, these greases resist washing and throw-off. Their superior wetting ability affords better coating of gears and better internal lubrication of wire rope.

STANDARD OIL COMPANY **STANDARD** (*Indiana*)

EXTRA-PRODUCTION



OPERATIONS EVERYWHERE ATTEST—

The EDISON ELECTRIC CAP LAMP double filament bulb saves hundreds of man hours every year—promotes greater underground safety

Teamwork plays a major role in realizing peak production in today's modern mining methods. And because teamwork relies completely on the availability of *every man,* bulb burn-outs may deal a crippling blow to operations.

Successful mine operators everywhere are finding the answer in the reserve protection of the Edison double filament bulb. A burned-out filament doesn't mean a lost shift for the miner and a short crew for the foreman. A turn of the switch transfers the power of the unfailing Edison battery to the second filament—restores continued, brilliant illumination. Teamwork is maintained, underground safety is assured. And because there is only *one bulb,* located in the *center* of the headpiece, Edison light has the advantage of maximum reflector area.

You'll find it profitable to investigate the production-safety benefits of the Edison double filament bulb.

MSA
SAFETY EQUIPMENT HEADQUARTERS

When you have a safety problem, M.S.A. is at your service. Our job is to help you.

MINE SAFETY APPLIANCES COMPANY
BRADDOCK, THOMAS AND MEADE STS. • PITTSBURGH 8, PA.
At Your Service: 67 Branch Offices in the United States and Mexico

MINE SAFETY APPLIANCES CO. OF CANADA LIMITED
Toronto, Montreal, Calgary, Winnipeg, Vancouver, New Glasgow, N.S.
Cable Address: "Minsaf" Pittsburgh

New Catalog Just Released . . . Many New Sizes!

NOW ASK for Bunting BRONZE it's Ready for IMMEDIATE DELIVERY



ASK FOR YOUR COPY OF CATALOG NUMBER FIFTY-TWO

★ STANDARD STOCK BEARINGS

There are nearly one thousand different sizes of Bunting Standard Stock Bearings. They range in size from 3/16" to 4½" bores—5/16" to 5" outside diameters—and ½" to 9¾" lengths. They meet practically every requirement for production and maintenance of machine tools and all kinds of industrial machinery. ALL ARE COMPLETELY MACHINED AND FINISHED, READY TO USE.

★ ELECTRIC MOTOR BEARINGS

Bunting Cast Bronze Electric Motor Bearings are available from stock FOR ALL MAKES AND SIZES OF ELECTRIC MOTORS. Dimensionally they duplicate the specifications of the motor manufacturer. Precision made, to very close tolerances, they always fit and are quickly and easily installed.

★ PRECISION BRONZE BARS

As compared with rough cast bars these save you 50% in machining cost and 25% in purchased metal. All Tubular and Solid Precision Bronze Bars are completely machined — all surfaces — I.D. — O.D. and Ends. Bores range from ½" to 6½"— outside diameters from 1" to 9", and solid bars from ½" to 8". All are 13" long. The size is stamped on every bar from end to end — you can always identify a piece.

Ask for Your FREE Copies of "AFBDA Bearing Maintenance Report"

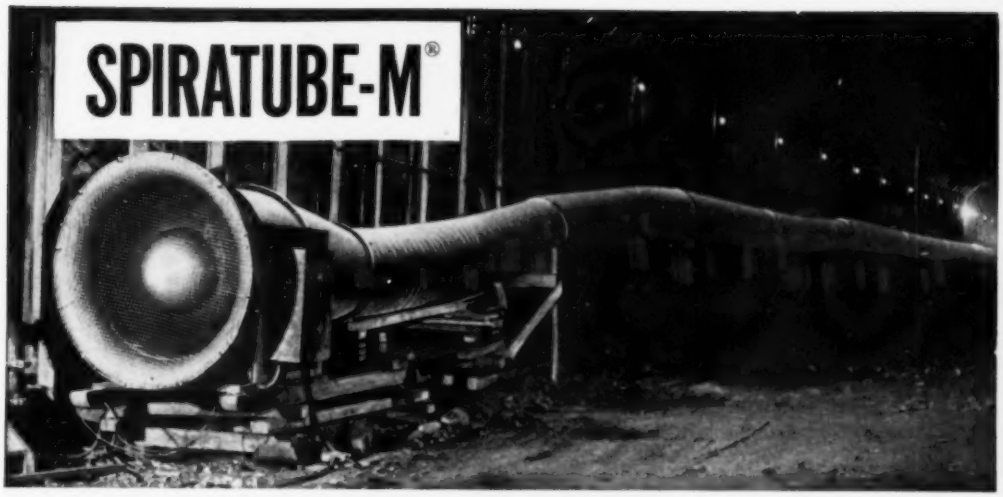
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Divisions of BEARING SPECIALISTS, INC.



Simplify mine and tunnel ventilation

Here's the airduct that can take it! Now you can deliver air to the working face of mine or tunnel — cheaper! That's because SPIRATUBE-M is built to cut maintenance costs! Ease of handling reduces installation costs. Unique SPIRATUBE-M construction features minimize leaks and seepage. And you get the maximum efficiency of your blower or fan . . . cutting power costs!

Immediately available in diameters to 30 inches, from fully-stocked distributors, SPIRATUBE-M is made in tough high count fabrics, all specially treated and heavily coated inside and out to withstand fungus, mildew and rough treatment.

And, patented, *built-in*, quick-couplers eliminate the need for separate parts . . . no need to look for couplers when you're in a hurry.

For heavy duty, pressure ventilation tubing without wire reinforcement, ask for AYRTUBE®. Sold in diameters to 36", AYRTUBE by itself or in combination with SPIRATUBE-M offers you an inexpensive airducting.

Check these features:



Handling ease

Lightweight

Flexible

Easily installed by you

Takes sharp turns without crimping

Withstands fungus, mildew, rough treatment

Flexible Tubing
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FREE BOOKLET DESCRIBES SPIRATUBE-M and AYRTUBE MINING AND CONSTRUCTION APPLICATIONS. Write for your copy today.

FLEXIBLE TUBING CORPORATION, Dept. CA-1, Guilford, Conn.

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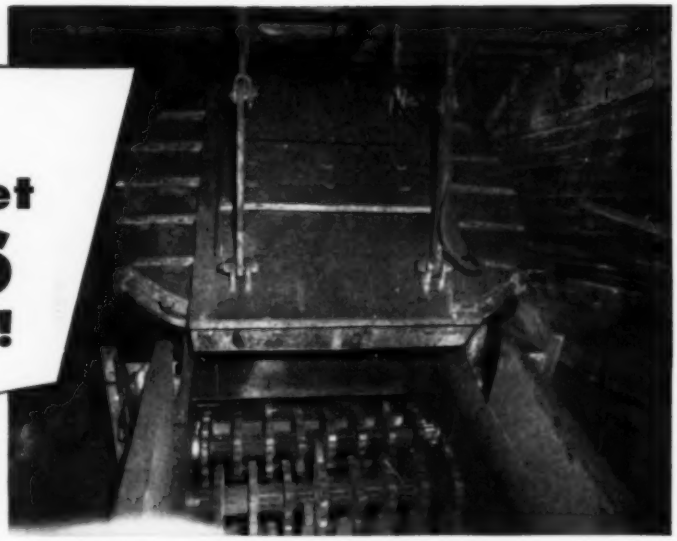
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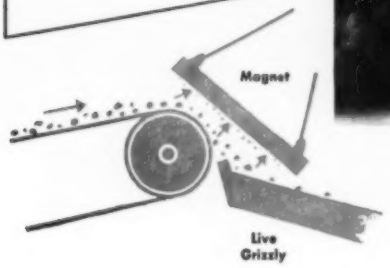
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Here's a Magnet that IS A Magnet!





New Dings "Dual-Voltage" RM Magnet at Orient Mine No. 3 Has 30" Range, Holds Iron Even if Power Fails!

Powerful protection for a 3290' belt! The new Dings Type RM Magnet at Chicago, Wilmington & Franklin Coal Company's Orient Mine No. 3 is a new and exclusive rectangular magnet design having tremendous power for its size and weight. Its effective range is 30" from the magnet face. Installed at the end of a short expendable belt, it protects against tramp iron damage the live grizzly and the costly 42" wide slope belt which is 3290' between centers.

This is the only magnet available that has been designed to meet modern mechanized mining conditions with very heavy burdens being carried at high speeds on long, wide belts.



Holds iron even if current fails! The new Dings RM Magnet pictured is the first "dual-voltage" magnet ever built, having an auxiliary battery-powered holding coil which prevents the accumulated load of iron from dropping back into the circuit in the event of a power failure.

No matter what your magnetic protection needs, Dings offers you a magnet for the job. Write today for details and literature.

SEND FOR AIME PAPER:

"Problems in Using New Large Super High Intensity Magnetic Equipment in Protecting Conveyors" by R. L. Manegold. This paper discusses modern iron removal problems and the new magnets available to solve them. Free on request.

DINGS MAGNETIC SEPARATOR COMPANY
4721 W. Electric Ave., Milwaukee 46, Wisconsin

Dings Magnets

Representatives in Principal Cities

World's Largest Exclusive Builder of Magnetic Separators and Lifting Magnets



You're looking at GUARANTEED top efficiency in coal cleaning and preparation!

EFFICIENT OPERATION — Records from mine after mine show 99%+ separating efficiency!

LOWEST OPERATING COSTS — Production records show cost per ton of coal cleaned to be consistently lower than any other system!

EXTRA WIDE SIZE RANGE — ¼" to 10"—PLUS ability to handle coal at operating gravities from 1.35 to 1.65. Washing gravity change-over on Chance Sand Flotation system can be made in five minutes by one man.

"Fairmont-Built" *GUARANTEED* plants can be designed in sizes ranging from 40 tons per hour up to any desired capacity, to suit your individual requirements. For help or advice on your coal preparation problems, call on the FAIRMONT ENGINEERS.

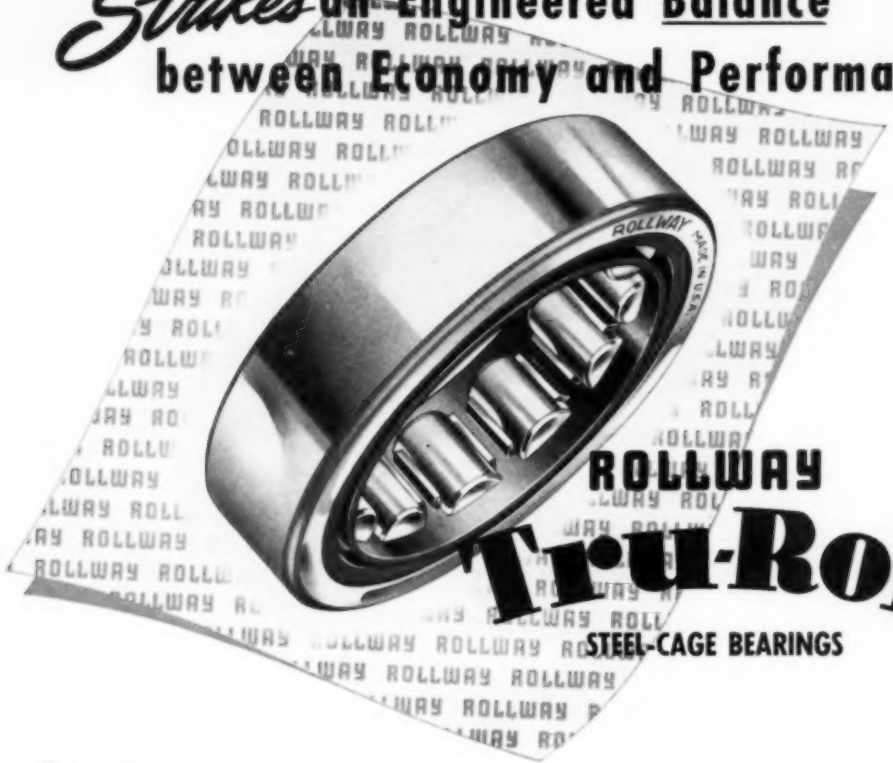
"FAIRMONT-BUILT"

FAIRMONT MACHINERY COMPANY

Fairmont, West Virginia

Designers and Constructors of Chance Sand Flotation Process for Wet Cleaning and American Pneumatic Separator for Dry Cleaning

Strikes an Engineered Balance between Economy and Performance



ROLLWAY Tru-Rol STEEL-CAGE BEARINGS

DESIGNED for good performance under reasonable limits of life expectancy, load capacity and cost requirements, the Rollway TRU-ROL is actually a better buy for normal, non-critical applications. *It is especially important where cost is a determining factor.*

That doesn't mean it is a "bargain" bearing. It isn't. Its low cost reflects: 1—ingenious steel-cage instead of bronze-separator construction; 2—years of know-how in cost-cutting methods; and 3—mass production by modern, high-speed, high-precision machinery and metallurgical facilities.

Outlasts Ordinary Low-Cost Bearings—The ingenious steel-cage of the TRU-ROL insures constant roller alignment and longer-than-usual life. It prevents skew, slide, end-rub and consequent power-loss and early-failure hazards. A side result is a thin, evenly spread lubrication film, hence cooler operation and lower running torque.

Let our engineers help you to select the Rollway bearing that is exactly right for your application. Our years of specialized bearing experience and complete engineering and metallurgical service are always at your command. No cost. No obligation.

Nationwide Replacement Service: Rollway bearings are available for replacement through authorized bearing distributors in principal cities. To locate, consult classified phone directories under BEARINGS. Rollway Bearing Co., Inc., Syracuse 4, N. Y.

ROLLWAY BEARINGS

ROLLWAY BEARING COMPANY, INC., SYRACUSE, N. Y.

SALES OFFICES: Boston • Chicago • Cleveland • Detroit • Houston • Los Angeles • Philadelphia • Pittsburgh • Syracuse

Aeroquip

REG. TRADE MARK



BRANCHING OUT!

The seed was planted only 12 years ago but the idea grew and grew. Now Aeroquip products serve dozens of major industries with a multitude of applications.

Originally, Aeroquip produced Flexible Hose Lines and Self-Sealing Couplings for military aircraft only. Successive developments, which actually set the pace for military standards, led to Aeroquip's present position of dominance in the fields of commercial as well as military aircraft.

The development of allied industrial products presented vast new opportunities. The "Aeroquip Idea"—bulk hose that can be cut to length and detachable, reusable fittings which can be easily assembled by hand—flourished among manufacturers and users of all types of industrial equipment. Even the farmer is counted among Aeroquip's customers.

Today, Aeroquip produces and sells more hose lines for industrial and aircraft applications than any other manufacturer.

AEROQUIP CORPORATION, JACKSON, MICHIGAN

SALES OFFICES: BURBANK, CALIF. • DAYTON, OHIO • HAGERSTOWN, MD. • HIGH POINT, N. C. • MIAMI SPRINGS, FLA. MINNEAPOLIS, MINN. • PORTLAND, ORE. • WICHITA, KAN. • TORONTO, CANADA

AEROQUIP PRODUCTS ARE FULLY PROTECTED BY PATENTS IN U.S.A. AND ABROAD



proved in the toughest service...

HAZACORD shovel cables

These cables can take it—they have to, for backing up the big shovels is as punishing as any job a cable is called upon to perform. Continuous dragging over sharp rock, exposure to all kinds of weather, tortuous flexing, coiling — it's all in a day's work for shovel cables.

Among the six types of Hazacord shovel cables you'll find the one that best meets the requirements of your particular operation. Take, for instance, Type SH-D: Over each insulated conductor you'll find a copper shielding braid; properly grounded, it equalizes surface stresses and drains off all capacity charging currents to assure safe handling. In addition, the three grounding conductors provide an adequate low resistance ground for the equipment. Like all Hazacord shovel cables, Type SH-D has the protection of the tough Hazaprene ZBF Sheath—a mold-cured, double layer of Hazaprene for added resistance to abrasion, wear and tear. Recommended for use up to 15,000 volts, Type SH-D is the safest, most used design for high-voltage applications.

For full information on Hazacord's many features that are delivering money-saving service to more and more operators . . . for performance characteristics and specifications of each of the six Hazacord shovel cables, ask your Hazard representative or write Hazard Insulated Wire Works, Division of The Okonite Company, Wilkes-Barre, Pennsylvania.



Hazard Type SH-D Shovel Cable

Embossed: HAZAPRENE ZBF P-1048M

HAZARD insulated wires and cables for every mining use

The Planetary Gears in Eaton 2-speeds save money for truckers



With Eaton's exclusive planetary design, gear speeds are slower; gear loads are distributed over several gear teeth, holding down stresses and wear. Planetary pinions turn only in the low speed range. In the high speed range they are locked out. The axle then operates as a conventional single-reduction unit. Eaton 2-Speeds are quiet in operation, easy to shift, and run long, trouble-free mileages. Genuine dollars-and-cents savings for truckers are assured by actual performance records representing billions of miles of operation.

Your truck dealer will be glad to explain how Eaton 2-Speeds will enable your trucks to haul more, faster, and longer, at lower cost.

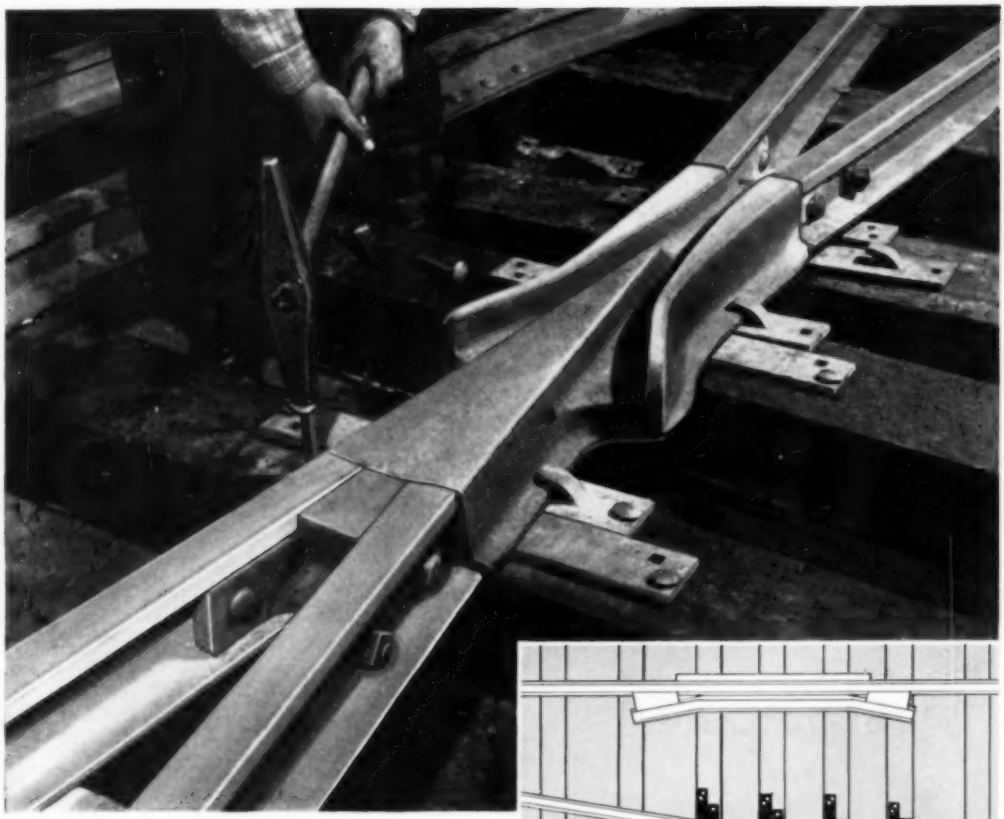
EATON *2-Speed Truck* AXLES

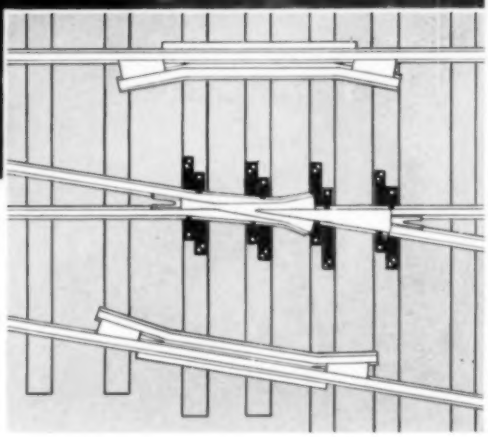


Axle Division
EATON MANUFACTURING COMPANY
CLEVELAND, OHIO

INVEST IN ADEQUATE ROADS

Today, America's roads are crowded with twice the traffic they were designed to carry. Help end the national traffic jam by speaking up for more and better roads.





How to Assure a Tight, Riqid Frog

One of the worst dangers to haulageway traffic is the loose, badly-aligned frog. But you don't have to risk such an installation. Bethlehem's Hook Plates will anchor the frog securely, preventing lateral movement in either direction. The frog stays rigidly aligned with the rails. No jiggle, no rattle, no loosening up.

As shown above, Hook Plates are always installed in pairs, each plate having its own integral hook. During installation the two plates are laid parallel, with one hook on each side of the frog base. A tight, snug grip results.

Plates are fastened to the ties by ordinary spiking—a quick, simple job. And here's another point you'll like: since the plates are used in pairs, you can install the one size at any tie position under the frog. No need for a large and confusing variety of lengths.

Bethlehem Hook Plates are low in cost, and there's virtually no maintenance. They'll earn their way by giving you tighter, safer track at the frog. Ask our nearest office for more details.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

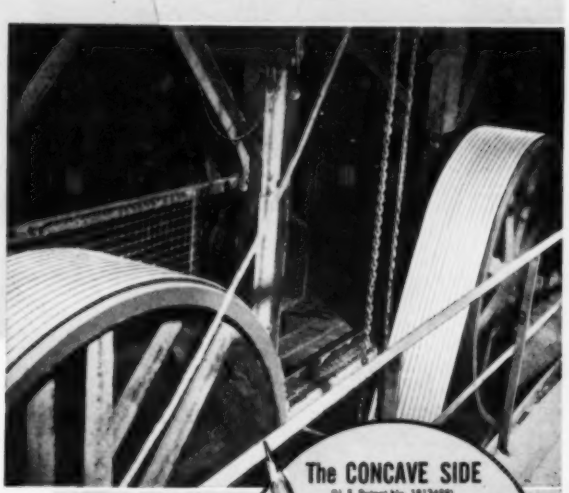
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

See for Yourself WHY

Gates Vulco Ropes Wear Longer

These tube mills at the Missouri Portland Cement Co., Kansas City, Mo., were formerly driven by long flat belts. Belt dressing, used to control slipping, picked up dust and built up an irregular cake on the pulleys—causing terrific tension on the belts and shock loads on the bearings. The bearings burned out; belts snapped. Replaced in 1946 by the Gates Vulco Rope Drive shown, belt failures have been eliminated and the drive installation is much more compact.





Make this Simple Test

Take any V-belt that has *straight* sides. Bend that V-belt while you grip its sides between your fingers and your thumb. You will *feel* the sides of the belt *bulge out*—as shown in figure 1-A, below.

Clearly, that outbulge forces the sides of the belt to press *unevenly* against the V-pulley —and this concentrates the *wear* where the bulge is greatest.

Now, make the same test with the belt that is built with the Concave Sides—the Gates Vulco Rope.

Figures 2 and 2-A show clearly what happens when you bend a Vulco Rope. Instead of *bulging*, the precisely engineered Concave Sides merely *fill out* and become perfectly straight. This belt, when bent, precisely fits its sheave groove.

Because there is *no bulging*, the sides of the Gates Vulco Rope always grip the full face of the V-pulley *evenly* and therefore wear *uniformly*—resulting in *longer belt life* and *lower belt costs for you.*

When you buy V-belts, be sure to get the V-belt with the Concave Sides--the Gates Vulco Rope!

Gates Engineering Offices and Jobber Stocks are located in all industrial centers of the United States and in 71 foreign countries.



What Happens When a V-Belt Bends

Straight-Sided V-Belt



How Straight-Sided V-Belt Bulges in Sheave-Groove. Sides Press Unevenly Against V-Pulley Causing Extra Wear At Point Shown by Arrows.

Gates Vulco Rope with Concave Sides



The Concave Sides Fill Out to a Precise Fit in the Sheave-Groove. No Side Bulge! Sides Press Evenly Against the V-Pulley—Uniform Wear—Longer Life!

CS-528-B

Gates VULCO ROPE DRIVES

THE GATES RUBBER COMPANY • DENVER, U.S.A.

V-Belts — Hose Molded Rubber Goods for industry World's Largest Maker of V-Belts



125-40

JEFFREY *Underground* CONVEYORS

● Illustrated is a Jeffrey entry conveyor into which room conveyors are discharging. The design and construction of these conveyors are the result of years of experience in meeting mine operators' needs for dependable, low-cost haulage. Each type has been thoroughly proved in operation under all kinds of operating conditions.

Rugged construction; Durable materials; Light weight design to facilitate moving; Simplified method of coupling sections; Dependable power equipment—are a few of the many design and construction features that result in economical operation and maintenance as well as safety to both equipment and workmen.

In addition to the chain type conveyors shown, Jeffrey offers a complete line of belt conveyors for main line haulage. Many of these are operating in conveyor and shuttle car equipped mines—another link in the Jeffrey line of cost saving mine equipment.

Consult a Jeffrey Engineer for specific details or write for catalog No. 820.

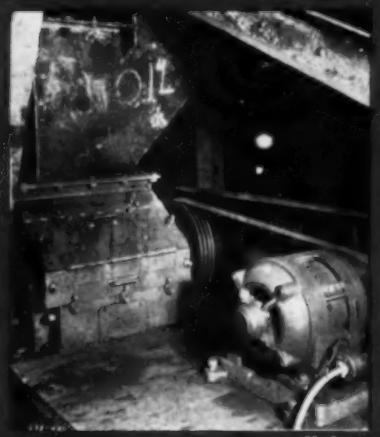
To meet specific size requirements

JEFFREY CRUSHERS

● To meet the exacting demands of today's coal markets, no one type of crusher can meet all requirements. Jeffrey's long experience in helping operators with coal sizing problems has resulted in developing a variety of types, each designed to answer a definite need. Each machine is adjustable to give uniform runs on a wide range of product sizes.

Jeffrey has a staff of trained reduction engineers to help you obtain the unit best suited to your needs. In addition, Jeffrey maintains a complete laboratory for running tests to help you obtain desired results. This is a Jeffrey service and entails no obligation on your part.

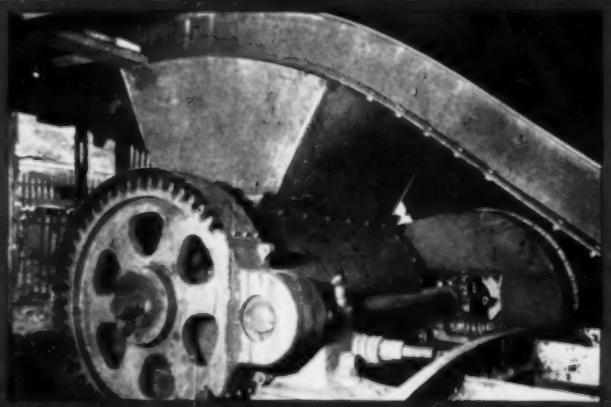
Consult a Jeffrey Engineer on your coal sizing problems. Catalog 784-A gives you pertinent data as to the various types and sizes of units, and to range of coal sizes and capacities.



638-42

Above—A 20" x 24" Flextooth Crusher installed in an Ohio mine producing a premium size product.

Right—A 30" x 36" Single Roll Crusher installation in a Kentucky mine reducing the entire output of the mine to various sizes.



658-42

THE JEFFREY MANUFACTURING COMPANY Established 1877

912 North Fourth St., Columbus 16, Ohio

1877 75 1952

Baltimore 2	Boston 16	Cincinnati 2	Detroit 13	Houston 2	New York 7	St. Louis 1
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Birmingham 3	Chicago 1	Denver 2	Harlan, Ky.	Milwaukee 2	Pittsburgh 22	

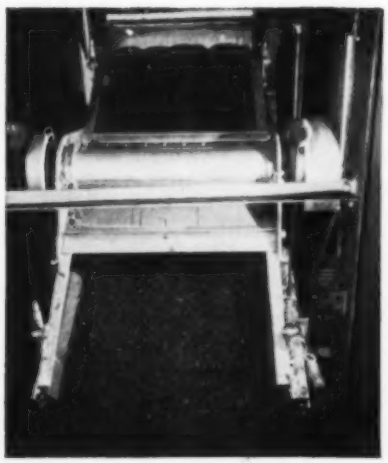
Jeffrey Mfg. Co. Ltd., Montreal, Canada
British Jeffrey-Diamond Ltd., Wakefield, England
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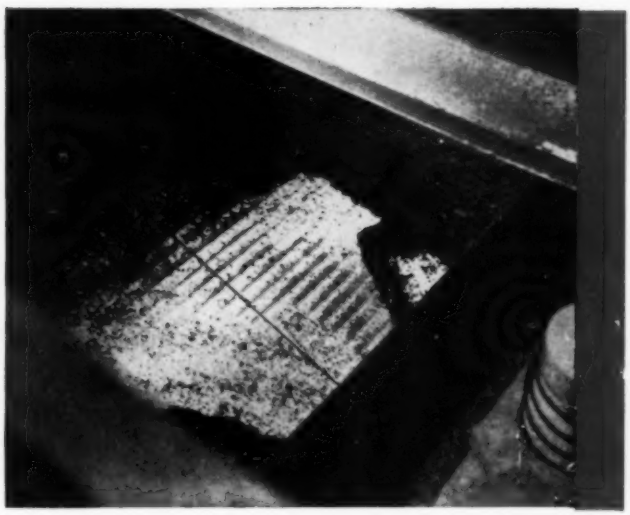
THIS SLUICEWAY, equipped with Hendrick's Type 410 Stainless Steel wedge slot screen, carries coal from the wet classifier to the clean coal dewatering vibrator at Orient No. 3.

Stainless Steel

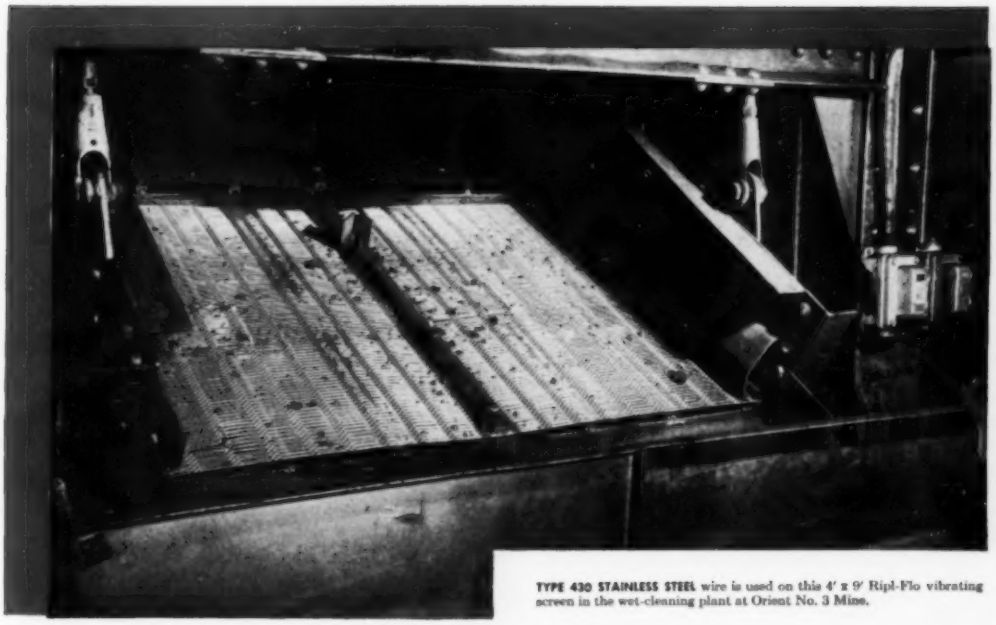
specified for preparation



THIS STAINLESS STEEL Ripl-Flo vibrating screen, handling dry middlings, is located in the wet-cleaning plant.



TYPE 410 STAINLESS STEEL is used in this wedge slot dewatering screen in a drag flite conveyor located in the wet-cleaning plant.



TYPE 430 STAINLESS STEEL wire is used on this 4' x 9' Ripl-Flo vibrating screen in the wet-cleaning plant at Orient No. 3 Mine.

screens

plant at Orient No. 3

THE preparation plant at Chicago, Wilmington & Franklin Coal Company's Orient No. 3 Mine at Waltonville, Ill.—as well as the mine itself—is an outstanding example of what can be accomplished when the facility is new "from the ground up." The equipment is modern and efficient and, therefore, includes screens of Stainless Steel.

The Stainless screens are found in both the wet-cleaning and dry-cleaning plants at Orient No. 3. According to Superintendent Fred Miller, four factors led the Company's preparation engineers to specify Stainless Steel screens for the new plant. These factors were (1) Stainless Steel's resistance to corrosion, (2) its freedom from clogging and blinding, (3) the minimum maintenance it requires and (4) its ability to prolong the life of vibrating equipment.

At present, one shift of the preparation plant at Orient No. 3 is handling the output of two underground shifts. The plant processes 7,000 tons of Illinois No. 6 bituminous coal per shift, and its ultimate capacity will be 14,000 tons per day.

You can realize the same benefits in your preparation plant that Orient No. 3 has through their use of Stainless Steel screens. With today's trend toward advanced methods of continuous mining and the demand for cleaner, more carefully sized coal, Stainless Steel screens merit your careful consideration.

At the present time, your screen manufacturer can obtain grades of U·S·S Stainless Steel that meet the requirements of most dry-cleaning operations and many wet-cleaning ones. These grades are U·S·S 12 (Type 410) and U·S·S 17 (Type 430) Stainless Steel. Ask your screen supplier.

UNITED STATES STEEL COMPANY, PITTSBURGH • AMERICAN STEEL & WIRE DIVISION, CLEVELAND • COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
NATIONAL TUBE DIVISION, PITTSBURGH • TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. • UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

U·S·S STAINLESS STEEL

SHEETS · STRIP · PLATES · BARS · BILLETS · USS · PIPE · TUBES · WIRE · SPECIAL SECTIONS

2-1644

UNITED STATES STEEL

What's New in hydroseparators?



THE DORR TYPE BW

a rugged center-shaft mechanism in the 40 to 75' diameter range.

Newest addition to the Dorr line of hydroseparators is the Type BW — a modification of the thoroughly proven and accepted Type H introduced several years ago. It is the *economical* answer to the problem of handling granular solids which do not warrant the use of the heavier Type H — but which are too heavy for a standard unit. Here are its major features...

Power to spare when you need it . . . through the BW's heavy-duty balanced worm and spur-gear drive.

Positive overload protection . . . by means of an automatic hydraulic lifting device activated by the torsional load on the mechanism. When an overload is encountered the rakes raise quickly — then lower slowly as the overload is reduced.

Unique Center-Shaft Design . . . combining an outer drive tube to which the pivoted drive rods are hinged and an inner lift tube which carries the rake arms.

Free, center-cone discharge — entire rake and drive mechanism is supported by a truss spanning the tank. Result . . . a clear center-cone area . . . providing unimpeded discharge of heavy solids.

The Type BW is available in diameters ranging from 40 to 75 feet. We'd like to tell you how it can fit into your picture economically . . . without obligation of course.

DOPRCO

Better tools TODAY to meet tomorrow's demand

DORR

WORLD-WIDE RESEARCH • ENGINEERING • EQUIPMENT

THE DORR COMPANY • ENGINEERS • STAMFORD, CONN.

Offices, Associated Companies or Representatives in principal cities of the world.



As with every other product, there can be weakling cables and robust cables. Weakling cables are those that can be classified as having anemia of the insulation. In other words, they do not have the insulation stamina to stand up under the electrical and physical conditions to which they will be subjected. It's this kind of cable that will haunt you.

Simplex-ANHYDREX XX Cables come from a robust family. They have a guaranteed water absorption of only 15 milligrams of water when tested in accordance with U.S.C.G. specifications. They will not crack when exposed to severe ozone conditions. Simplex Anhydrex XX insulation is so robust that it will withstand these tests before or AFTER the insulation has been aged for 7 days at 250°F. (121°C.). Simplex-ANHYDREX XX Cables are recommended for operation at copper temperatures up to 176°F. (80°C.) in either wet or dry locations.

Here is an insulation that doesn't ask for special favors. It's the kind of insulation you should have on your important feeder, network, and station cables that operate in the voltage range of 2,000 to 17,000 volts. These cables won't haunt you.

Want to know more about this robust insulation? Simply send your request to the address below.

SIMPLEX-ANHYDREX XX

SIMPLEX WIRE & CABLE CO.
79 Sidney St., Cambridge 39, Mass.

BETTER Coal Preparation Plants *Call for* EXPERIENCE

Plus MODERN DEVELOPMENTS BORN OF TECHNICAL RESEARCH

Way back in 1905 Heyl & Patterson designed, fabricated and erected its first complete Coal Preparation Plant. The succeeding years have witnessed many additional H & P contracts for complete Preparation Plants for the Coal Industry.

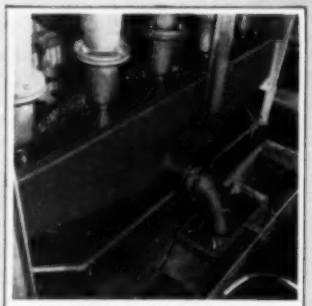
Today, more than ever, the building of satisfactory Coal Preparation Plants calls for many years of specialized experience in the cleaning and preparation of coal and a "progressive outlook" for new and improved methods of coal preparation.

Heyl & Patterson is constantly searching for ways to improve coal preparation methods . . . to save money . . . to increase efficiency . . . to increase production.

Heyl & Patterson has the experience, the facilities and the personnel to take an assignment from the "idea" stage through the "successful operation" stage. We have our own Engineering Department . . . our own Research and Development Department . . . our own Structural Shop . . . our own Machine Shop . . . our own Erection Department . . . and the desire to improve on what has already proven successful.

Heyl & Patterson can guarantee Controlled Low Cost, because WE CAN DO THE WHOLE JOB . . . all the way from design to erection and satisfactory operation.

A Fine Coal Cleaning Plant recently completed by H & P for a large Ohio coal producer serves as an example of how H & P incorporates modern improvements in the design and erection of Coal Preparation Plants. It is equipped with two products of H & P's Research & Development Department . . . H & P Cyclone Thickeners and an H & P Thermal Coal Dryer.



A partial view of H & P 14" Cyclones discharging underflow which contains recovered -10 to -100 mesh fines.



A feed-end view of the Heyl & Patterson Thermal Coal Dryer.

Heyl + Patterson, Inc.

"SINCE 1881"

Heavy Bulk Materials Handling Equipment

All The Way from Design to Erection

55 WATER STREET • PITTSBURGH 22, PA.

You helped design these better ropes



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For the heavy-tonnage loads...



Here's your car!

In spite of its low, graceful, streamlined appearance, this is really a big brute of a mine car. It's a giant with a giant's strength. Holds 17 tons—easily—and won't go to pieces after a brief term of service. This big fellow is built to carry the tonnages year after year.

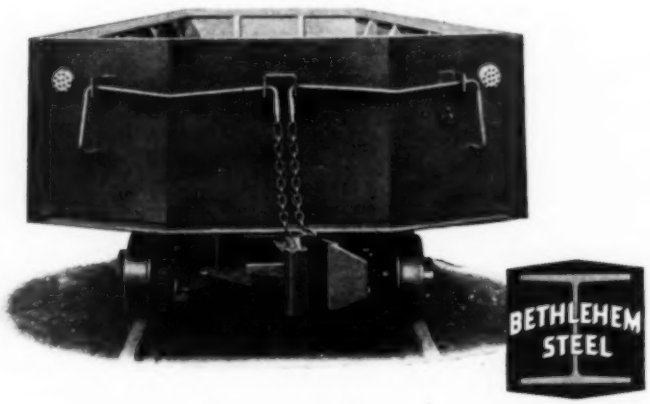
Designed for use in bituminous mines, it is equipped with cast-steel, high-speed trucks, automatic couplers, roller bearings, eight forged wheels, and body of Mayari R corrosion-resisting steel. It's a Bethlehem-built model that has already proved its economy and overall value in coal mines with high-production schedules.

Bethlehem of course builds many other kinds of mine cars, large and small. There is often a definite need for the smaller type of car, especially in anthracite mining, and we are well equipped to produce such units in quantity.

Always feel free to talk with us about your haulage problems. Our engineers will gladly co-operate in matters involving car design and construction.

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Regardless of what you want to convey or where you want it to go, Raybestos-Manhattan has a conveyor belt engineered to carry the load . . . Belts for mining, quarrying or construction work that are unequalled for natural troughing, flexibility, tear resistance and ability to hold fasteners. There are R/M conveyor belts with extra-cushion features for heavy duty shock loading . . . Others for hot materials . . . Still others for high tensions, long lifts. Then too there are R/M belts for light duty — packages, parts, cases or cans • Conveyor belts may not be your problem today, but whenever you think of transmission, conveyor or V-belts — or *any* industrial rubber product — remember "Raybestos-Manhattan makes it", and call your R/M representative.

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Other R/M products include: Industrial Rubber • Fan Belts • Radiator Hose • Packings • Brake Linings • Brake Blocks Clutch Facings • Asbestos Textiles • Sintered Metal Parts • Bowling Balls



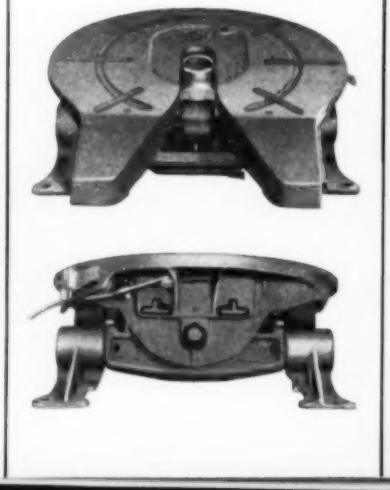
Marion shovel, loading a 34-ton coal payload into one of 23 Austin-Western trailers powered by Dart tractors. Scene is at Midland Electric Coal Corporation's strip mine near Farmington, Ill.

ASF Safety 5th Wheels have to be tough to stand up in this heavy-duty service, especially during wet weather when tractors are needed at each end of the semi to get it out of soft ground. Because ASF 5th Wheels are so easy to uncouple, in effect Midland has a *flexible pool* of load-carrying equipment and motive power, rather than 23 separate units. The result is fuller, more efficient use of available equipment.

Back and turn on a dime—In addition to quick interchange between motive power and load-carrying equipment, the tractor-trailer is highly maneuverable. ASF 5th Wheels are side-oscillating: even a full load can be safely and easily jackknifed for a short turning radius.



Heart of the semi—the ASF 5th Wheel—36" extra-heavy-duty ASF Safety 5th Wheel made for the rugged service and heavy loads found in off-highway work. Note the heavily reinforced plate; the massive "I" section center beam; the extra-strong mounting brackets.



He speaks through firsthand experience—M. R. Heckard, Superintendent of Equipment, has used ASF Safety 5th Wheels on all semi's for 11 years. He particularly likes the comparatively new 36" wheel shown at left; feels it will cut maintenance costs to a new low.



The Midland Electric Coal Corporation proves that your best investment for efficient tractor-trailer operation is an ASF Safety 5th Wheel . . .

"Best of all—they're easy to uncouple"

Ease of uncoupling is one of the big reasons why ASF Safety 5th Wheels are standard equipment on the fleet of semi's at Midland Electric Coal Corporation's strip mine near Farmington, Ill. M. R. "Marty" Heckard, Superintendent of Equipment, says:

"We use ASF 5th Wheels on all our semi's, and each wheel takes a real beating during the loading and hauling of a 34-ton payload around 30 times a day.

"One of the main reasons why we like these 5th Wheels is because they are easy to keep free of slack. We just add a shim usually once a year.

"Best of all, however, they are easy to uncouple in a matter of minutes. We can easily shop the tractor for maintenance without the trailer, or vice versa. Working on one at a time makes servicing easier, and we avoid tying up the whole semi."

Quick interchange between motive power and load-carrying equipment is a real asset in mining and quarry work. And there's no denying that you get it with a tractor-trailer. But a 5th wheel—or any hitching device—tends to defeat its purpose if it's hard to uncouple.

Easy uncoupling can save you time, trouble and expense, as it has in this modern strip mine operation. But, it's equally important to know that the ASF Wheel *only uncouples when you want it to uncouple.* This is no beefed-up highway wheel. It's made specially for heavy-duty off-highway service, from the "I" section center beam to the side-oscillating plate that absorbs the sidestrain of uneven roadway. Until a twist of the wrist releases the king-pin, it's built to *stay* coupled—come shocks, strains or high water!

Get the facts on the best 5th wheel investment you can make! See your nearest ASF Distributor, or write: American Steel Foundries, Automotive Division, 410 N. Michigan Avenue, Chicago 11, Ill.

remember this . . . about ASF safety 5th wheels

Largest king-pin bearing area of any 5th wheel . . . Stresses absorbed by a larger bearing area—larger than any other 5th wheel—means longer life for king-pin and jaws.

Shorter king-pin bending leverage . . . Jaws grip the king-pin at the top. The pin *stays straight*—and can't "spring" or disengage.

Side oscillation protects equipment . . . 1½° of free oscillation—plus 5½° controlled by rubber stabilizers—absorbs sidestrain of uneven roadway.

Heavy, cast alloy-steel construction . . . Plate is hinged on strong, rigid "I" beam with big 2" pin. Extra large contact area between plate and beam doubles rocker life. Both rocker and cast-steel bracket are bronze-bushed to cut wear to a minimum.

Easy to maintain in perfect operating condition . . . Wear is inevitable, but on ASF Wheels, it's easily counteracted simply by inserting one or more low-cost shims between buffer and housing front wall. Result? Like-new service, without expensive rebuilding!

A quick glance tells you the lock is LOCKED . . .



LOCKED—as quickly shown by the lever position. The easy-to-see lever can only be in this position when the jaw are truly locked.



UNLOCKING—with an easy twist of the wrist. Simply move the safety dog up, and pull the lever forward.



UNLOCKED—and ready for coupling. The lever moves back to locked position only when the jaws are locked!

A 3,000-pound "compression-grip" saves your maintenance dollars . . .



COUPLING—as the king-pin enters the jaws, the jaws are forced back against the exclusive ASF rubber buffer block, building up compression.



COMPRESSING—3000 pounds are built up before the lock clears the rear jaw, allowing lock to snap to locked position.



LOCKED—and the jaws *remain* under compression. The grip is like a vise; eliminates the slack and backlash that can cost you money in added 5th wheel and king-pin wear.



Shield and slotted bolt partially expanded, after insertion in hole.



Fewer Roof-Fall Accidents
WHEN YOU ROOF-BOLT

Roof-fall accidents are less likely to occur when roof bolting is used. This is because the roof bolts, anchored at their upper and lower limits, consolidate varying layers of strata into a single-unit, thick beam. Roof bolting also increases the operating efficiency of the mine by eliminating timber supports, thus providing larger floor areas in which to operate mechanized equipment. It makes possible faster transportation and improved ventilation, and is economical because the bolts hardly ever need maintenance.

To help operators obtain these ideal conditions, Bethlehem produces the two types of roof bolts described below. These bolts are made from new-billet steel in a wide variety of lengths. They can be installed vertically or at angles. They can be combined with roof plates, roof ties, roof channels, plate washers and angle washers.

If you would like to have detailed information about how you can use Bethlehem Roof Bolts to best advantage, write to us at Bethlehem, Pa.

BETHLEHEM SLOTTED ROOF BOLT. One end of bolt has forged slot to accommodate wedge. The slot is automatically centered by an exclusive process which forms the equivalent of two half-rounds. No steel is lost through burning. The opposite end of bolt has 5 in. of 1-in. rolled threads. When driven against back of hole, the wedge is forced deep into the slot, expanding bolt ends to provide tight grip. Truncated-cone point prevents thread damage. Furnished with American Standard Regular Square Nut.

BETHLEHEM SQUARE HEAD ROOF BOLT (With Expansion Shield). This assembly consists of a special unchamfered square-head, rolled thread, ¾-in. bolt, plug, and expansion shield. Two pressed ears on bolt shank support the shield during anchoring. When bolt is tightened, the plug is forced down into the shield, expanding the leaves of the shield to provide holding tension. Sharp projections near the top of each leaf contact the sides of hole, to prevent shield from turning when bolt is rotated.

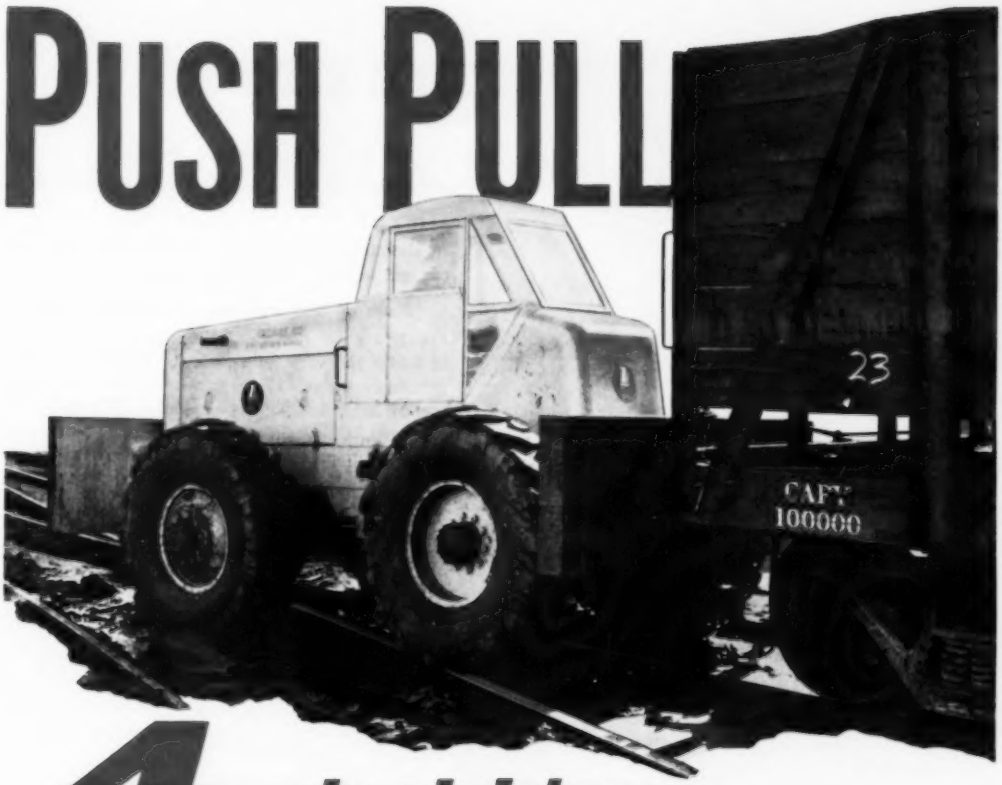
BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

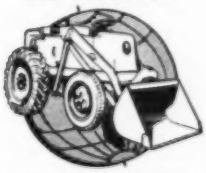
BETHLEHEM MINE ROOF BOLTS

PUSH PULL



4-wheel-drive PAYLOADER *Tractor*

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"PAYLOADER" Tractors and Tractor-Shovels are sold by a vast network of leading Distributors in all principal cities throughout the free world. They have complete parts stocks and finest service facilities.

This unusual switcher represents a new, faster and cheaper way to move cars at plants, yards, terminals and docks. With torque converter, big pneumatic tires and 4 wheel drive it has more pushing power than rail mounted switchers of equal weight. It walks right across the rails to reach its next assignment via the shortest, quickest route — works on pavement, ground, ties or snow.

This Model TM "PAYLOADER" Tractor pushes or pulls in either direction, in four speed ranges up to 24 mph. Short wheelbase, power-booster steer and big hydraulic brakes give it extreme maneuverability, ease of control and safety. If *you* have car-moving problems get full facts on the Model TM. The Frank G. Hough Co., 765 Sunnyside Avenue, Libertyville, Illinois.

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In shooting for pay loads, you will find that you can get better fragmentation if you

"Hook up and Detonate with PRIMACORD"

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Wound on light weight spools, easily carried, Primacord is easy to handle on the job. Use it for trunk line hook ups and down hole branch lines. It fires instantaneously from a blasting cap yet cannot be set off by friction, sparks, ordinary shock or stray currents.

To keep those trucks rolling keep PRIMACORD unrolling

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Also Safety Fuse since 1836

There's a type for every job. **PLAIN PRIMACORD** for shallow holes and surface trunk lines; **REINFORCED PRIMACORD** for deep holes and resistance to abrasion; **WIRE COUNTERED PRIMACORD** for deep, ragged holes; and **PLASTIC REINFORCED PRIMACORD** for deep holes and unusual wet conditions.



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The PROVED and APPROVED DETONATING FUSE

Devoted to the Operating, Technical and Business Problems of the Coal-Mining Industry

Coal Age

OCTOBER, 1952

IVAN A. GIVEN, EDITOR

Coal for Chemicals

IF THE VALUE of a ton of coal can be increased, for example, by $3 over the value in its natural state, and if the cost of processing to attain that increase is only $2 per ton, the stage is at least partly set for a profitable advance in coal economics. It is not completely set because there must also be a market for the products at a price that will provide the necessary revenue. This in turn brings in the question of whether the same products can be derived from other materials—oil and natural gas, as examples—at a lower cost. Thus, markets first, price second, cost of processing third and competitive sources fourth all become factors in the final determination.

What the answers are is as yet not fully known. However, as related in the feature starting on the following page, these answers are being obtained. One line of attack is hydrogenation with a new slant. Another is carbonization and new refining techniques for obtaining quality chemicals but leaving most of the input as a solid fuel usable in existing equipment. Major unknowns are, first, markets for chemicals of a magnitude hitherto unknown and, second, cost of processing. The developers, however, are optimistic. If their expectations are realized, coal will have not only a significant new outlet but also will have achieved an advance that will make it easier to move into other markets—synthetic fuels, for example—when competitive prices permit.

Paring It Down

HOW TO GET a reasonable profit is of course one of coal's major preoccupations—as it has been for many years. With the return to a buyer's market and the increases expected in the new contracts, the problem becomes even-more acute. With competition both within and from without the industry imposing an effective if unofficial ceiling, the answer still lies largely in attaining lower cost.

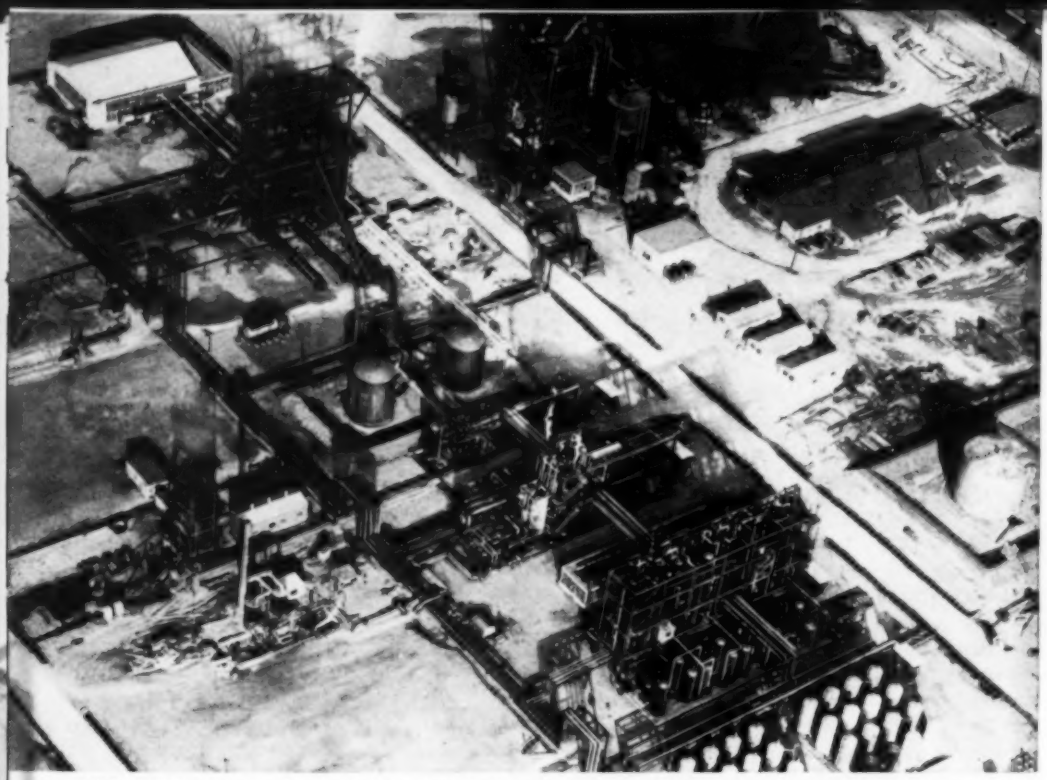
Can it be done? The answer is "Yes" for a large majority of mines, though naturally the degree of reduction varies from property to property. The old-reliable method is machines and machine methods. Are there any others? Again the answer is "Yes." A significant number of companies have achieved real results with little or no added expenditure for equipment. The starting point is average realization at the going market price. Subtracting the desired net gives the maximum cost per ton. Then each operation is carefully studied to see where improvements can be made. It is not a glamorous method but it is effective and the rewards are well worth the effort. In fact, it could even work out, as it has in many instances, that an even-greater saving can be made than was originally anticipated.

Critical Day

"ONE BIG QUESTION before the voters again this year is whether or not the federal government will be permitted—in fact, directed—to grow in size and dominance over every thought and action of the individual."

"The present administration failed miserably in capitalizing on its opportunity [to achieve a lasting peace] with the result that today our effectiveness has been largely dissipated and we find ourselves in a very difficult if not actually perilous situation."

The preceding quotes from an editorial in the October, 1948, issue of *Coal Age* highlight some of the things that must be considered in making a choice next election day. This year is again a decision year. More than ever it demands two things of every citizen: (1) sober analysis of party records and platforms, and (2) putting the conclusions into effect by voting Nov. 4.



PIONEERING a new coal use, Carbide & Carbon's pilot plant sprawls along the Kanawha River at Institute W. Va.

Coal for Chemicals: How Much

Today, two top companies are pioneering new frontiers in coal technology. With hydrogenation and carbonization, they are . . .

Setting their sights on practical goals.
Wringing more dollars from a ton of coal.
Building a base for synthetic liquid fuels.

"WE'RE IN THE CHEMICALS BUSINESS. We're working with coal because it contains the raw materials we want." That's how Carbide & Carbon Chemicals Co. explains its chemicals-from-coal pilot plant at Institute, W. Va.

"We're in the coal business. Our customers use solid fuel. We want to keep them content and upgrade our product at the same time. So we hope to strip premium-price chemicals out of coal and sell them. We'll have left a high-Btu char that's a good boiler fuel." That's the thinking that lies behind laboratory and pilot-plant work of Pittsburgh Consolidation Coal Co. at Library, Pa.

Both companies—Carbide & Carbon and Pittsburgh Consol—will make chemicals from coal. But because their aims are different, each has chosen a process that is best suited to its own needs.

Carbide & Carbon's coal-conversion process is hydrogenation—but it's hydrogenation with a difference. It's aimed at making chemicals, not liquid fuels. To make liquid fuels, Carbide & Carbon would have to move on to more complex processes in a plant that would cost a good deal more, and the end products would be liquid fuels selling for a lot less than the chemicals they'd be made from.

Pittsburgh Consol's coal-conversion process is carbonization—but it's carbonization with a new twist. Some 30% of the coal is converted to liquids—not fuels, but chemicals—the remainder to boiler-plant char.

Both processes, now in the pilot-

If chemistry is Greek to you, this list tells you . . .

What Chemists Can Make From Coal Chemicals

Phenol	Resin moldings, such as radio cabinets and toys; detergents; drugs like aspirin and bactericides; weed-killers and disinfectants; rubber; shoe polish; motor oils and greases.
Xylene	Coatings and finishes, auto and aviation gasoline, ink pigments and synthetic fibers.
Naphthalene	Plastics and coatings, automobile finishes, shower curtains, mothballs, Vitamin K, auto seat covers, wool and cotton dyes, insect repellants.
Xylidines	Dyes and pickling inhibitors.
Indole	Perfumes, pharmaceuticals, and amino acids for treating burns and surgical wounds.
Toluene	Furniture finishes, fingernail polish, auto and aviation gasoline, head-lice killer, saccharin, food preservatives and soap scents.
Toluidines	Rubber goods, textile dyes, pigments for printing.
Benzene	Styrene for synthetic rubber; paints, adhesives, waterproofings, finishes, nylon, DDT, motor oils and greases, and the new wonder drug for treating tuberculosis.
Cresol	Disinfectants, aviation gasoline and laminating varnishes.
Aniline	Tires and tubes, life rafts, textile dyes, photographic supplies, sulfa drugs and rocket fuel.
Quinoline	Fungus and mildew destroyers and nicotinic acid (Vitamin B).

— and When?

plant stage, can move in the direction of synthetic liquid fuels, on which the U. S. Bureau of Mines is spending big money. But neither Carbide & Carbon's full-scale plant nor that of Pittsburgh Consol would cost anywhere near the Bureau's estimate for a commercial synthetic liquid fuels plant. Besides, where the Bureau loses some 50% of the heat value of coal in changing it to liquid fuel, energy waste by Pittsburgh Consol is negligible. Both private-enterprise projects are the fruit of new basic thinking about coal conversion. Both aim at goals closer to the Nation's immediate needs. Both raise the challenge of adventure in research, product development and discovery of markets yet unknown.

Out of both projects, two down-to-earth questions emerge for coal men. These questions are:

1. What will chemicals-from-coal mean tonnage-wise?

2. What kinds of coal will be most useful?

The answer to the second question is pretty clear at this stage. Most bituminous coals east of the Mississippi and some coals west of the Mississippi are suitable, though low-ash, low-moisture, high-volatile coals with a high tar yield are preferred for Pittsburgh Consol's process. Carbide & Carbon and Pittsburgh Consol now are getting good results with Pittsburgh-seam coal. For making chemicals by Pittsburgh Consol's process, deep-mined coal is far better than strip-mined coal.

The answer to the first question is where adventure lies.

Nobody now knows how big a coal market will grow out of chemicals-from-coal. But Carbide & Carbon has spent 17 yr in research and $11,000,000 on a 300-tpd pilot plant in full confidence that the market for coal chemicals will grow.

Old hands at Carbide & Carbon expect the same kind of adventure that began some 30 yr ago, when the company pioneered with aliphatic chemicals. Until there were enough aliphatics for research-and-development men to work with, nobody knew that aliphatics would be turned into synthetic rubber, paints, medicines and a thousand other products. By the same token, nobody now knows how much can be done with aromatic chemicals from coal—and nobody will know until there's more to work with.

Demand for coal will parallel the curve of the development of markets for chemicals. "Will those markets rise or fall?" is not the question. The real question is: "How much will they rise?" Here are some of the indicators of future growth:

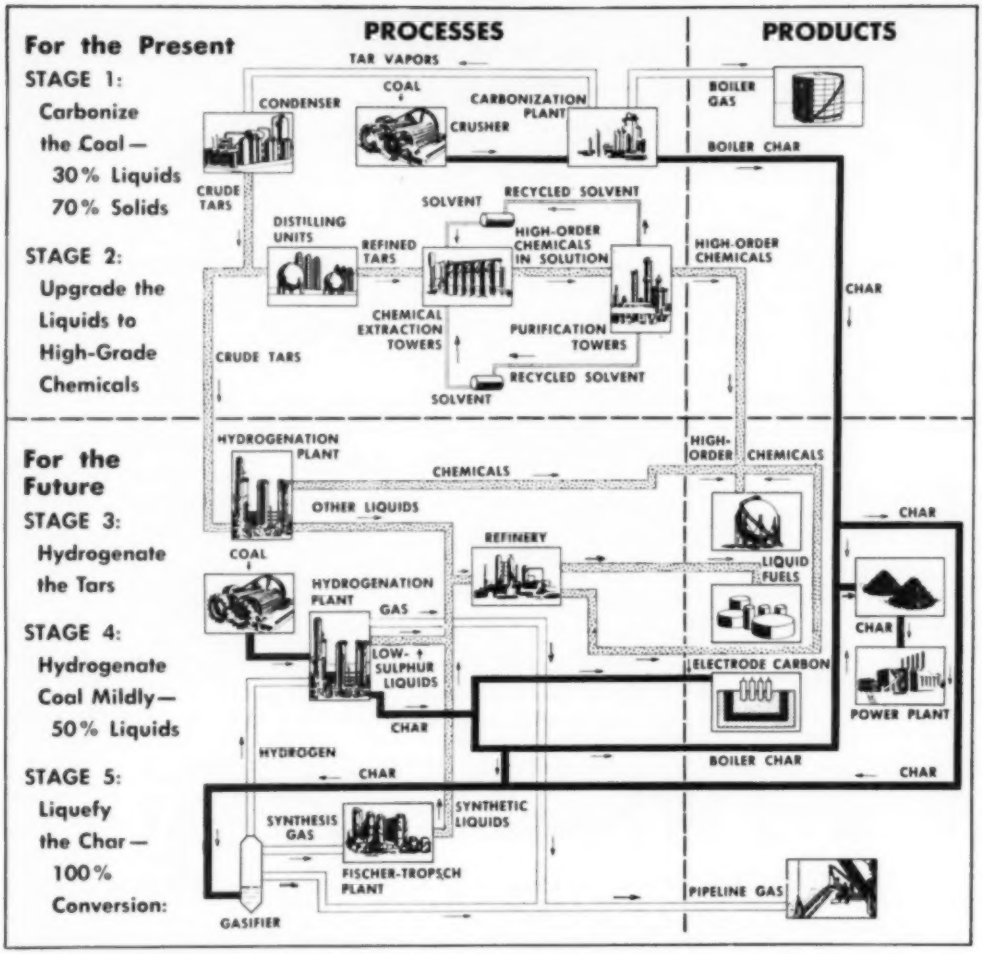
1. Markets for chemicals will rise from $7,000,000,000 in 1951 to $25,000,000,000 in 1975, says Ray Ewell, Standard Research Institute. This prediction reflects an annual rate of growth from 1929 to 1951 of 9%—a rate exceeded only by the air-transport and aluminum industries.

2. New end uses are boosting demand for some aromatics by 25 to 36% a year. Nearly all aromatics now are by-products of coke-oven operations. Since coke-oven capacity recently has grown only 3 to 5% a year, there's a big gap to be filled that won't be filled by growth of steel-industry coke ovens.

3. Carbide & Carbon says that its 300-tpd pilot plant now turns out 1% of the company's needs for benzene. You can have a little fun speculating with that figure—but don't stumble into bear traps. Take it this way: Assume that Carbide & Carbon decides to make all the benzene it needs. In a coal-hydrogenation plant making chemicals, it then would take 30,000 tpd of coal to make enough benzene for the company. That would call for nearly 11,000,000 tons of coal a year.

But here's Bear Trap No. 1: About half of the benzene the company uses goes into making phenol. Phenol is a direct product of hydrogenation. So, making phenol directly, the company would need less benzene. That way, Carbide & Carbon's coal needs might be cut by, say, half. Even so, there still would be a market for 5,500,000 tons of coal a year.

Bear Trap No. 2 is this: The present 300-tpd plant provides about 20% of the naphthalene the company needs today. On this basis, a 1,500-tpd plant—roughly 500,000 tons a year—would produce enough naphthalene. But a 1,500-tpd plant wouldn't produce enough benzene. Expand the plant to fill benzene needs, and you glut the market with naphthalene—unless you can find new markets for naphthalene. And that's where adven-



CARBONIZATION yields chemicals and char for Pittsburgh Consol, later may produce liquid fuel if fuel economics gives go-ahead for building oil-from-coal plants.

ture lies: developing new products and finding markets for them. Carbide & Carbon men have done that kind of pioneering before, and they like it.

4. A fourth indicator of future coal-for-chemicals demand shows up in the market position of Pittsburgh Consol and that company's plans for the future. A company that mines close to 30,000,000 tons of coal a year isn't likely to sink time and money into ideas that promise less than 1,000,000 tons a year in new markets. Take that as a working minimum, and go on from there. Pittsburgh Consol's plans now are tied more to the development of markets for char—large boiler plants for power, for example—than to the chemicals market. The company's carbonization process, now approaching perfection, will convert only some 30% of the coal to chemicals. At that rate, there's no immediate risk of flooding the chemicals market.

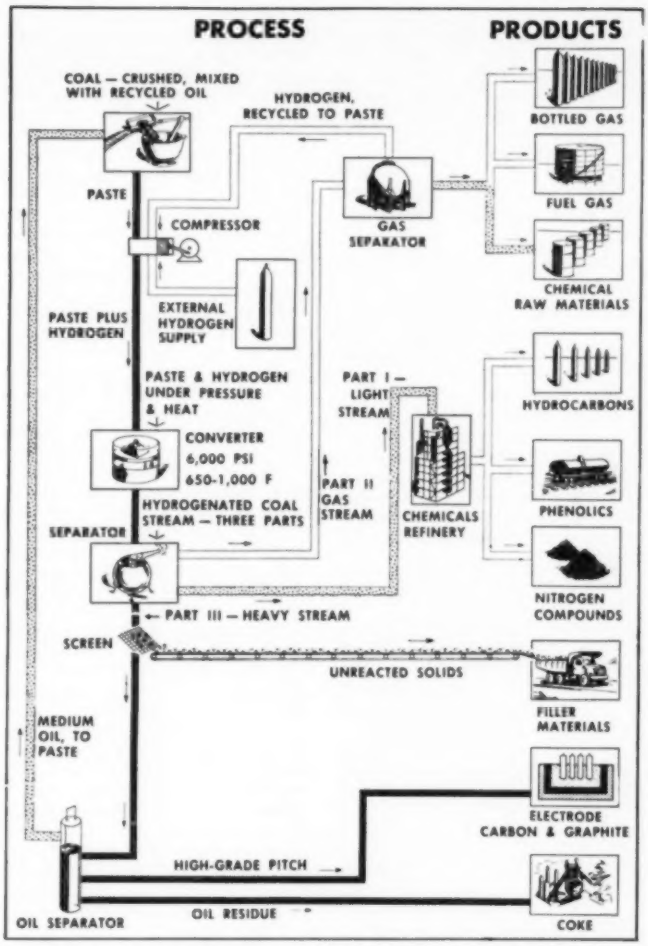
For the long term, the company sees it this way: Production of chemicals from coal will follow the upward curve of demand for aromatic chemicals for some years yet to come. Sometime in the future—how long, nobody now knows—synthetic liquid fuels will begin to play a substantial role in coal production. Then, the coal-use curve will break upward sharply.

Why Carbide & Carbon Uses Coal . . . And What It Makes

WHY TURN TO COAL for chemicals?

Carbide & Carbon got its start some 30 yr ago in aliphatic chemicals, now called petrochemicals. These are compounds with an open-chain molecular structure. They are derived from petroleum and natural gas. To put it mildly, the company did well—and still is doing well—with aliphatics.

But in the 30's, the Bureau of Mines began to see the end of petro-



HYDROGENATION turns out high-order chemicals and other products in Carbide & Carbon's pilot plant.

leum and natural gas. The answer, as Carbide & Carbon saw it, lay in coal. Coal could be made to produce methane-to-butane gases, the raw materials for most aliphatics. In addition, coal would produce large quantities of aromatic chemicals. These are cyclic, hexagonal, molecular structures.

Right away, the company saw possibilities of wide uses for aromatics. Then, as now, they were made mostly as coke-oven by-products. They include, among other compounds, benzene, phenol, cresol and xylenol, which in turn can be used to make synthetic rubber, phenolic resins, surface coatings and countless other products.

The trouble, especially since World War II, is that demand for aromatics has far outstripped coke-oven capacity. Carbide & Carbon set out to free aromatics from this limitation and make them a primary product of coal, not a by-product. The company built its pilot plant at Institute, W. Va., several miles down the Kanawha River from Charleston. There, on a relatively small scale, coal now yields the basic building blocks of the aromatic group—benzol, toluol, naphthalene, phenol and aniline, to mention only a few. Compared with coke-oven production, Carbide & Carbon's plant multiplies the output of naphthalene per ton of coal by 5 to 8 times; phenol, 60 to 80 times; quinoline, 300 to 500 times; and aniline, infinitely, since almost none now is recovered from steel and merchant coke ovens.

There are two other reasons why Carbide & Carbon turned to coal. For one thing, coal is cheap and abundant, and so well scattered over the country that a chemicals-from-coal plant can be located almost anywhere. For another thing, the company had been busy a long time with underground gasification of coal. In the course of this work, boreholes had become bigger and bigger. In the end, Carbide & Carbon actually was bringing considerable tonnages of coal to the surface and putting it through a gasification plant. Since the company already was in the coal-mining business this way, though on a small scale, it was easy to think of doing more with coal.

How Pilot Plant Works

Carbide & Carbon's pilot plant started up late last spring with a feed of 300 tpd. By this time, it probably is taking in 550 to 600 tpd. The grapevine reports that the plant broke even and maybe did a little better on 300 tpd. With higher tonnage input, it should turn a tidy profit. In fact, company officials now are talking about building a 3,000-tpd commercial plant. This plant, they estimate, would cost less than $45,000,000 in 1952 dollars.

The process is direct coal hydrogenation—that is, liquefaction of coal by adding hydrogen under elevated temperature and pressure. But it's hydrogenation with a difference, as pointed out earlier. Here are some of the differences between Carbide & Carbon's pilot plant at Institute and the Bureau's demonstration plant at Louisiana, Mo.:

1. Carbide & Carbon's process is a single-stage conversion of coal into chemical liquids and other products; the Bureau's process, a multi-stage conversion into liquid fuels, with certain chemical by-products. The Carbide & Carbon conversion is simpler and cheaper.

2. At Institute, coal is crushed to about 20-mesh; at Louisiana, to about 200-mesh.

3. At Carbide & Carbon's plant, temperature is 450 to 500 C; pressure, about 6,000 lb. Pressure is somewhat lower than at Louisiana.

4. Residence time of coal paste in the converter at Institute is from 3 to 5 min, against some 45 min for the Bergius process, on which the Bureau's method is based.

5. Carbide & Carbon's equipment is newly designed to withstand erosion by ash and fusion carbon. At wearing points, pipes and valve seatings are lined with tungsten carbide. Caps on the converters are the largest

stainless-steel forgings ever made.

6. At Institute, the crushed coal is forced into solution with pasting oil at high speed; at Louisiana, somewhat more slowly.

7. Carbide & Carbon has greatly reduced the quantity of catalyst used and sees a chance of eliminating it altogether.

8. At Institute, there's no coking-up in the reactor. This is made possible by elevating the hydrogen vapor pressure and eliminating voids.

9. Carbide & Carbon uses by-product hydrogen from nearby industrial plants. This hydrogen probably costs the company as little as 15 to 20c per million Btu, against a cost of about 80c for making it. More hydrogen, when needed, is available from other plants in the Kanawha Valley. Besides, Carbide & Carbon has found a way to pare hydrogen needs. At the Bureau's plant, hydrogen is manufactured especially for use in the demonstration plant.

What the Plant Yields

With these differences from the Bureau's process, Carbide & Carbon turns out three primary products in its plant, as follows:

Product 1—A gas stream of hydrogen and C_1-C_4 hydrocarbons, with some other gases. The hydrogen from this stream is recycled to the paste. The hydrocarbons are raw materials for fuel gas, bottled gas and some chemicals. Gas output is controllable and is kept at a minimum.

Product 2—A heavy oil containing unreacted solids. The solids, suitable for filler materials, are removed. The oil is split into three fractions. The top fraction is used to flush out heavy oil remaining in the solids. The middle fraction is recycled to the pasting operation. The heavy fraction contains high-premium pitch that's in demand for electrolytic carbon, high-purity graphite and high-grade coke for use in metal-alloying plants.

Product 3—A light oil containing the bulk of the chemicals. This is broken down into an acid fraction (phenolics), a basic fraction (aryl amines and nitrogen heterocyclics) and a neutral oil (hydrocarbons).

Carbide & Carbon engineers explain their process this way: In ordinary coking ovens, high temperatures kick and jolt the cyclic carbon molecules pretty severely. The products of this rough treatment are a good many low-order double pieces, such as benzene, phenol and toluene, plus some small pieces. Coal hydrogenation, in contrast, nudges the molecules gently. It turns out not only the usual coking products but also sizable quantities of higher aromatics such as naphthalene, cresols and higher phenolics and amines. All told, Carbide & Carbon produces from 150 to 175 gal of liquids per ton of coal. Up to now, company chemists have identified well over 100 chemicals coming out of the plant.

With these products, Carbide & Carbon sees markets shaping up somewhat this way:

First sales will be high-boiling phenols chiefly monohydric alkyl-substituted phenols, and aromatic hydrocarbon solvents.

For captive use, there'll be benzene, naphthalene, phenol, cresols, xylenols and aniline.

Later, when more is known about quantities produced and methods of refining, there'll be toluene, xylenes, mixed toluidines, indole, mixed xylidines, alkyl pyridines and quinoline.

Finally, some chemicals, already detected but still problematical as far as markets are concerned, may be available for sale or use. These include indane, acenaphthene, fluorene, anthracene, phenanthrene, indanol-4 and -5, dibenzofurane, 3-phenylphenol, 2-methylquinoline, 2-methyl-6-ethylpyridine and 3-methylindole.

As stated earlier, Carbide & Carbon men are betting on new markets for aromatics. Take methylnaphthalene, for instance, which will be produced in some quantity. Dr. J. G. Davidson, president, puts it this way: "We do not know at this time what methylnaphthalene is good for . . . but I am confident that a market for this chemical and its chemical derivatives will develop as soon as it is regularly available on a commercial scale at a reasonable price."

Dr. Davidson and his associates point out that 30 yr ago, when the company went into the aliphatics business, no commercial uses were known for ethylene oxide, ethylene glycol, ethanolamines and "Cellusolve." These four products now are sold in quantities exceeding 2,000,000,000 lb a year for making solvents, antifreezes, coolants, cellophane, explosives, hydraulic brake fluid, synthetic resins, lacquers and emulsifiers.

As for profits, Carbide & Carbon, like other companies, is in business to make a fair return. The chances look good. In the Bureau estimates of revenues for a coal-to-oil hydrogenation plant, chemical by-products account for about 60% of income. With gasoline wholesaling around 13c a gallon and with benzene bringing some 37c a gallon, toluene-xylene 32c a gallon, xylenol 15c a pound, and phenol and cresols 17c a pound, there's some merit in the question: "Why build a costly multi-stage plant to convert high-value intermediate products into low-value end products?"

Because Carbide & Carbon's process can be controlled to produce varying quantities of selected products, it's uncertain how much value will be added to a ton of coal by converting it to chemicals. But from where the company stands now, it looks like a profitable business.

Pittsburgh Consol Sees Chemicals Plus Solid Fuel

A NEW KIND OF COAL CARBONIZATION may put Pittsburgh Consol into the chemicals business and, at the same time, strengthen the company's solid-fuel markets among electric utilities and other big boiler plants. In a nutshell, Pittsburgh Consol's process partially converts coal through continuous distillation of volatiles, and follows through with new methods for refining the resulting liquids.

By Oct. 15, the company will have a brand-new pilot plant on stream. The new plant replaces earlier pilot plants and includes all the new techniques discovered in the company's laboratories and revealed in old plants.

Here's how Pittsburgh Consol explains what it's doing now and what it sees ahead:

FOR THE PRESENT

Stage 1—Crushed to minus 10-mesh, coal is fed continuously into a large vessel. There, in a fluidized bed of whirling, dancing particles, coal is carbonized at 900 to 950 F at atmospheric pressure. Gases are drawn off at the top of the vessel, solids near the bottom. Most of the gases are condensed to form unrefined tars. Some fuel gas is produced. The solids make up into a high-Btu char. In Stage 1, about 30% of the coal is converted to liquids and gases. A commercial plant with a throughput of 2,000 tpd is estimated to cost about $2,000,000, give or take a little.

Stage 2—Unrefined tars are upgraded, first by distillation, then by solvent extraction of compounds in the

distilled fluids. The products are high-order chemicals. Cost of this addition to the basic 2,000-tpd plant would be around $3,000,000.

FOR THE FUTURE

Stage 3—It may be practicable to hydrogenate the heavier portion of the tars flowing from carbonization and thus turn them into liquid fuels or more chemicals. In fact, Pittsburgh Consol has farmed out a study along this line to the Bureau's laboratory at Bruceton, Pa., where small-scale hydrogenation equipment already is available.

Stage 4—Sometime in the years ahead, Pittsburgh Consol may turn to a mild hydrogenation process that will convert some 50% of the coal to liquids. This would be done under medium pressures. Products would be pipeline gas; a special char, which would be suitable for power-plant boilers or for metallurgical uses; and some 60 to 70 gal of low-sulphur liquids per ton of coal input, containing large quantities of chemicals, which would be further refined. Cost estimates for Stage 4 are not yet available.

Stage 5—Still further in the future, Pittsburgh Consol may convert nearly 100% of the coal input to liquids and gases. This stage would take up where Stages 1 and 4 leave off. Instead of selling char from these operations for boiler fuel, the company would gasify the char and convert the resulting synthesis gas into liquid fuels in a Fischer-Tropsch plant. Besides synthesis gas, this process could produce pipeline gas, ranging from 900 to 1,000 Btu per cubic foot, and high-order chemicals. Hydrogen released in gasifying the char would be recycled to Stage 4.

Dollar-wise, Pittsburgh Consol's carbonization set-up looks something like this for the next several years, before the company moves into Stages 3, 4 and 5: In Stage 1, a ton of coal will produce from 30 to 40 gal of tar valued at 8 to 10c a gallon; 1,000,000 Btu of boiler gas worth about 17c; and 0.7 ton of char containing about 18,000,000 Btu, selling roughly at 17c a million Btu. The value of the original ton of coal thus will be lifted from, say, $4.75 at the mine to around $6.

In Stage 2, refining the tar will produce low-boiling tar acids such as phenol, cresol and cresylic acids; xylenol; and some carbon-black feedstock and electrode carbon. Here, in Stage 2, the value of the original ton of coal will be pushed up to around $7.50. From these figures, of course, must be deducted operating costs and amortization of investment, both of which will be considerable.

The economics of Stages 3, 4 and 5 still are problematical and speculative, though Pittsburgh Consol already has moved along with laboratory work to the point where Stages 1 and 2 stood some 2 or 3 yr ago. The speed with which the company moves into these later stages on a commercial scale will hinge mostly on the economics of aromatic chemicals and of petroleum and natural gas and the rate at which these fuels fall behind market demands at acceptable prices. As top men in the company see it now, they expect carbonization for chemicals and char—Stages 1 and 2—would be a profitable business. Meanwhile, they are perfecting the base of a workable synthetic liquid fuels industry. If the need arises, they can erect the superstructure when the time is ripe.

The char turned out by Pittsburgh Consol's pilot plant, as pointed out, makes a good boiler fuel. That's what the company likes about its process. The solid product contains very little hydrogen and no moisture. It reflects Pittsburgh Consol's basic interest in providing a suitable solid fuel for growing industrial markets.

In additon to the normal Btu content of the char, about 2 to 3% of the energy content is sensible heat remaining after carbonization. With this in mind, Pittsburgh Consol envisions the carbonization plant built next door to boiler plants—within half a mile, at the very most. That way, the char can be transported with hot flue gases without substantial loss of sensible heat. For an aluminum plant located near a coal mine, the set-up would be a natural—cheap power from char, plenty of carbon for electrodes, no freight charges for handling coal and, if within close range of markets, low freight charges on ingot or finished aluminum.

On the chemicals side, Pittsburgh Consol figures that a boiler plant now using 3,000 tpd of coal would call for a coal throughput of 4,500 tpd of coal in the carbonization plant to provide the necessary Btu's in the form of char. That's 1,620,000 tons of coal a year—a sizable market in anybody's language.

Research Takes Long View

Pittsburgh Consol has been wise about its carbonization and chemicals research. Predecessors in coal carbonization gave most of their time and money to the carbonization process alone and neglected the thorny problem of refining the tar and extracting the chemicals. That's where they stubbed their toes. Pittsburgh Consol did it differently. About 60% of the company's research dollars went into a study of refining and extraction. The results are showing up now in improved primary distillation of the tars and the substitution of solvent extraction, with full recovery of the solvents, for costly thermal and caustic extraction in upgrading the products of distillation. The company has been able to move ahead with these studies irrespective of down time in the carbonization pilot plant, because plenty of comparable unrefined tars have been on hand for experiment from the company's commercial Disco plant.

Weighing its plans and projects against present and foreseeable needs of the Nation, Pittsburgh Consol feels it has hold of something far better than full-scale production of synthetic liquid fuels at this time. Company officials put it this way:

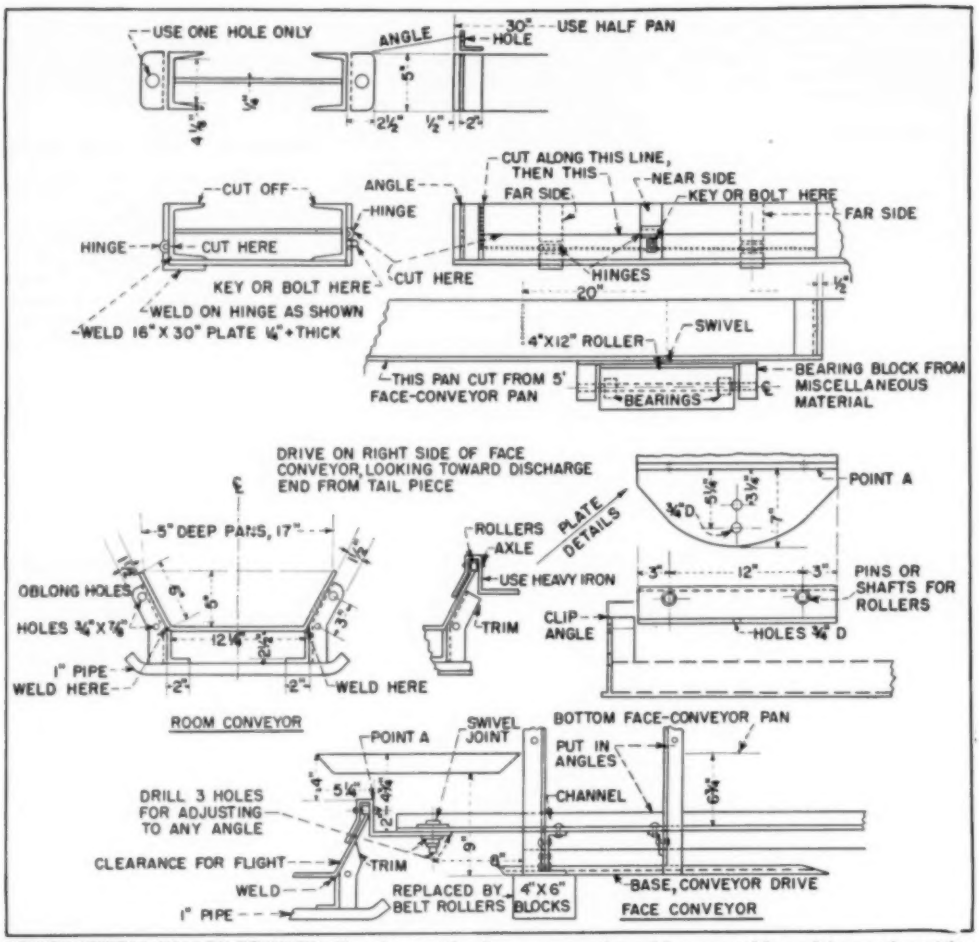
"One way of achieving national security to a substantial degree is not to waste our premium fuels on low-grade uses such as steam-raising. The first step in increasing our supply of gasoline, for example, would be to turn more of our crude petroleum into gasoline and diesel oils. This can be done more easily, more quickly and more economically than any known coal-conversion process can do it. . . . We believe the solution for our company and in the light of present fuel economics lies in a method of partially converting coal. We have made considerable progress in this direction."

★ ★ ★ ★ ★

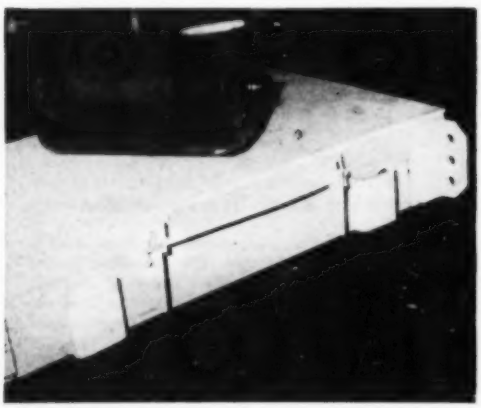
How Industry Can Lose Its Freedom

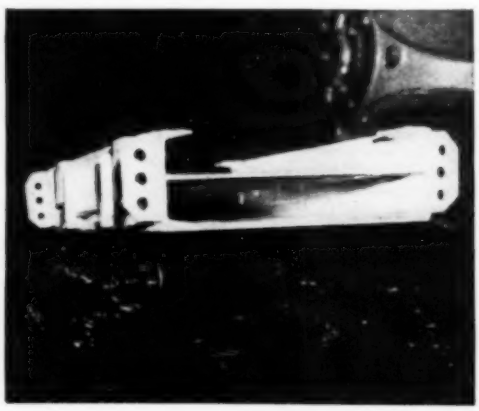
"Obviously, gentlemen, the time has come when it behooves all of us to search for a better way to settle our disputes. The American people are patient but they will not sit by forever and permit strikes to endanger our national defense, to impede our industrial progress and to wipe out the savings of thousands of workers, many of whom—in some cases—are not directly involved in the controversy. Ultimately the force of public opinion is going to compel drastic action in Washington—action which can only result in further suppression of our precious liberties."

—Benjamin F. Fairless, president, U. S. Steel Corp.



KEY TO JEWELL VALLEY RESULTS—New three-section face conveyor for quick moves with a minimum of resetting of timbers. Design details are shown above. Photos of key sections showing caster rollers and split hinged section for quickly breaking chain appear below and on opposite page.





Conveyor Redesign Ups Efficiency

With loading time of 42%, Jewell Valley gets 15 tons per faceman in 24- to 46-in coal with very-bad roof and adverse conditions. Secret is wide-face mining with company-developed three-section face conveyor permitting quick moves with resetting of only two posts.

By JOHN R. SHORTRIDGE, Superintendent,
Jewell Valley Mine, Jewell Ridge Coal Corp., Jewell Valley, Va.

REDESIGN of the face conveyor for use under bad top has cut moving time one-third at the Jewell Valley mine. Tons per man consequently have been increased substantially with a major gain in safety. Only two posts now have to be removed to advance the face conveyor and drawslate now can be held on timber. A major factor in the new setup is a special face-conveyor connecting pan made in the Jewell Valley shop.

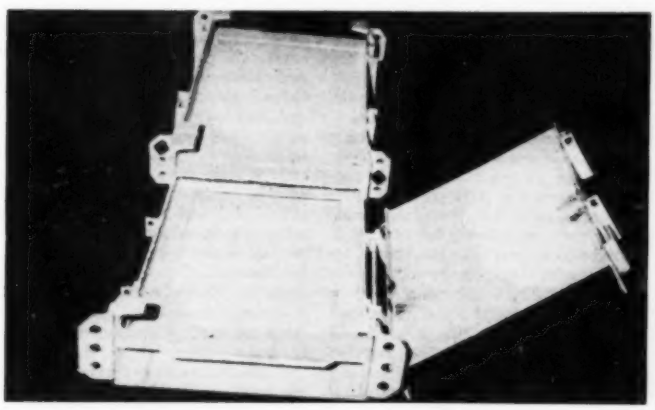
Jewell Valley is in Buchanan County, Virginia, on the head of Dismal River, about 35 mi east of Grundy and 8 miles north of Jewell Ridge. It is one of three mines operated by the Jewell Ridge Coal Corp. in this area.

The seam is known locally as the Jewell Ridge, varies in height from 24 to 46 in, generally has bad roof conditions, is very uneven and rolly, and has many faults and wants, steep haulage grades and difficult mining conditions. One or more partings make preparation of the coal a real problem underground.

The strata overlying the seam consist of layers of shale and sandstone, with the fragile layers of shale ranging from 0 to 20 in thick immediately over the coal. This layer of shale tends to fall when the coal is removed and requires close timbering. With close timbering, this shale roof generally can be held in faces worked by conveyors and only mine posts are needed to support it. The quality of the coal from this seam is excellent.

Considerable tonnage is hand-loaded by miners directly into mine cars but the mine gradually is going to mechanical mining. The low-height coal is being worked with shaker conveyors, duckbills, chain conveyors and crawler loaders loading onto chain conveyors. A part transition from hand loading into mine cars to mechanical loading, and from hand loading into conveyors to crawler machines loading into mine cars, was started in 1944, but during this period (1944 to 1952) various types of mechanical loading did not prove adaptable to our natural mining conditions.

Wide-face mining has proven to be the best method adaptable to this seam, especially when a crew can load 35 to 45% of the time.



THE MINING PLAN

Our present plan of mining is based on entries 1,500 to 2,000 ft long driven in pairs. Rooms are 270 to 300 ft long, wide faces are 40 ft and narrow faces 20 ft wide. Rooms are on 45-ft centers in very low coal and on 50-ft centers in higher coal. Room crosscuts are on 40-ft centers and are driven 10 ft wide, leaving a pillar 30 ft long and 5 ft wide. This pillar is not recovered.

All timbers are set 4 ft apart except along the roadway, which is parallel with the room conveyor. Here they are set 6 ft apart. An additional line of posts can be set in this roadway when needed. We keep permanent timbers to within 8 ft of the face. Safety timbers are set 4 ft apart and almost parallel to the face. About 20 permanent timbers are set each cut. The face conveyor can be kept parallel with the face or at any desired angle and this determined the pattern of a standard timbering plan.

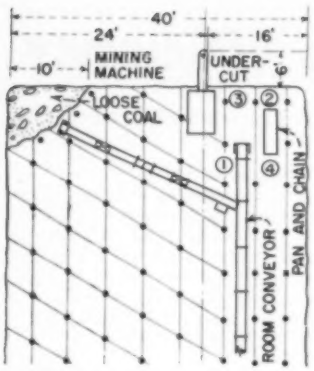
The wide rooms are driven with 14 ft on the clearance side of the center line and 26 ft on the gob side. The center of the room conveyor is kept 5 ft to the right of the center line.

Conveyor mining is not new to us, since we started in 1934, and have been doing all kinds since.

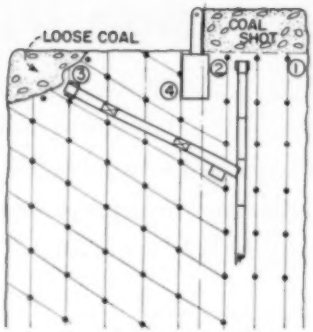
Face conveyors in wide rooms have been tried in this mine on face widths from 30 to 60 ft, under bad and good conditions, and in low- and high-coal sections with variable, good and bad results. The time required to move up the face conveyor under bad roof and heavy drawslate, the resetting of permanent timbers, etc., has been the deciding factor against this type of equipment. There have been times when moving the face conveyor up required twice the time necessary to load the coal out of the cut.

We have used rubber-tired and crawler loading machines feeding to chain conveyors but find that we do better with a newly developed face conveyor and loading by hand in sections with bad roof conditions. Our coal is strictly domestic and we realize considerably more from lump than slack sizes and therefore we must produce the greatest percentage of lump sizes possible. We have found that we use the same quantity of explosives in a 40-ft room face as in a 20-ft face and produce a better-quality coal. When we use any type of loading ma-

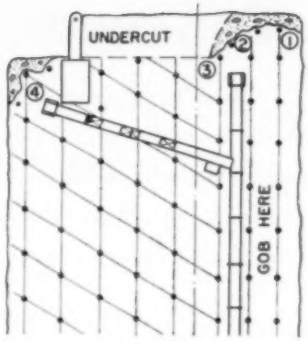
Abstract of paper presented before the 18th Annual Virginia State-wide Safety Conference.



1 Start with coal on left from preceding cut. Machine cuts over to position shown. Man 3 drills holes and prepares to shoot. Men 1, 2 and 4 extend room conveyor. No. 3 shoots.

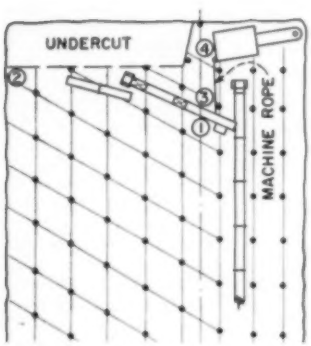


2 Men 1 and 2 start loading into room conveyor. Man 3 loads loose coal from preceding cut into face conveyor. Man 4 cuts and loads clean cuttings into the conveyor.

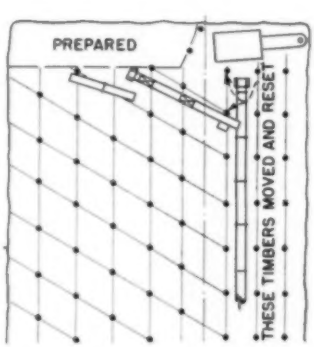


3 Man 4 cuts over and loads coal remaining from previous cut into face conveyor. Man 3 takes a position back of Man 4 to bugdust cut and start drilling for shooting.

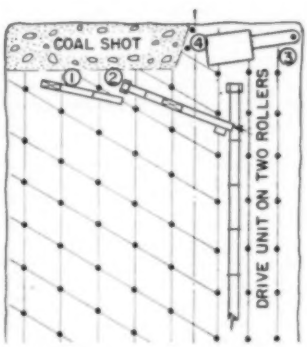
How Jewell Valley Face Cycle Is Set Up to Make Use of



6 Man 1 gets timber and Man 2 sets timbers. Men 3 and 4 attach machine rope to face conveyor and move it into its new position.



7 Face conveyor moved up. Timbers all set. Machine in position ready to sump. Left side of face ready for the shooting operation.



8 Coal shot down on left side. Men 1, 2 and 3 load from positions shown. Man 4 starts to sump cutting machine on right side. Man 3 dusts.

chine we get too much slack as a result of having to shoot the cut harder because the machines do not have enough digging power.

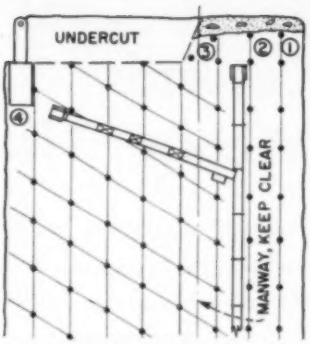
FACE-CONVEYOR REDESIGN BASIS FOR NEW METHOD

The management developed a three-section face conveyor that could be broken down and moved up between timbers in a minimum length of time. The necessary equipment to change the conveyor into a movable unit consists of two half pans and two rollers attached to the face-conveyor drive so that it will run up and down or along the top side of the room conveyor. The face conveyor drive also has three rollers (from 4-in-diameter belt rollers) installed under it so that it can be easily moved as desired. These rollers are installed casterlike so they will move in any direction. Modification was done in our shops. Two connecting pans are used in each face conveyor, one next to the conveyor drive and the other at the middle of the conveyor.

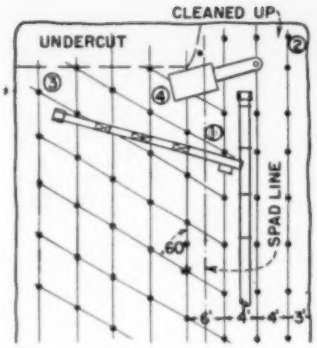
The connecting pans are made from the standard 61 HG Jeffrey face conveyor pans, each being cut into 2½-ft lengths and then split lengthwise on each side as shown in the accompanying sketch. These two parts are then hinged together and a plate is welded under the bottom. This arrangement simplifies the cutting of both top and bottom conveyor chains, which is done as follows: (1) pulling up slack enough in the top chain with a homemade comealong with two hooks and cutting the chain, (2) turning the top half of the pan, (3) again cutting the chain with the aid of the comealong and then, (4) disconnecting the pans, all of which can be done in a very short time.

The face-conveyor drive is fitted with a swivel attached to the discharge end, and is equipped with two roller wheels riding on the near side of the room conveyor as a track to facilitate moving the drive, and to keep the discharge end of the drive in position for loading into the room conveyor at any angle between 45 and 90 deg.

Time studies have shown that this conveyor can be moved up under bad



4 Coal from the preceding cut cleaned up. Present cut completed. Sump hole almost completely cleaned up. Timber can be set on either 4- or 5-ft centers, whichever is required.



5 Sump hole cleaned up. Men 1, 2 and 4 move cutting machine into position for sumping and moving up of face conveyor. Man 3 tamps shot holes in preparation for firing.

Moving Face Conveyor

Face conveyor first is moved down the room conveyor toward the mouth of the room. The tail end is moved in toward the tail of the room conveyor. Then the unit is moved toward the face the desired distance and the face conveyor opens to the desired angle. At the same time, it is put between the post (see Step 6).

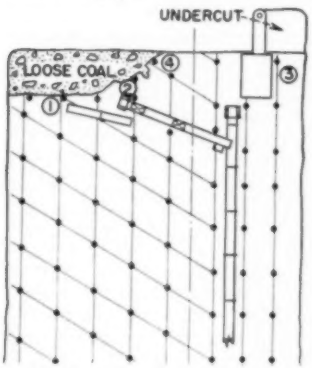
The face conveyor can be set at any desired angle with the room conveyor. Sometimes a 90-deg angle is desirable.

Note—Posts are shown schematically. Four men are shown in each place, but additional men may be added without changing the cycle.

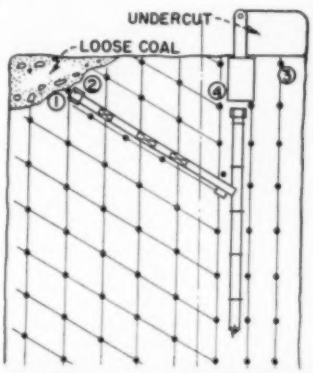
FOUR-ROOM SET-UP

Foremen	1
Supplymen	1
Hoist and boom men	1
Cutting-machine operators (No. 4)	4
Helpers and loaders (No. 3)	4
Hand loaders (Nos. 1 and 2)	8
Facemen, 4 to each place	8
Boomman	1
Utility man, rock dusting, supplies, clean-up coal dust, etc.	1
Foreman	1

New-Type Face Conveyor



9 Machine sumped. Men 1 and 2 load. Man 4 helps until 16 ft is cleaned up for sumping clearance. Man 3 dusts and drills.



10 Men 1, 2 and 3 continue to load. Man 4 cuts and loads clean cuttings to the room conveyor. Cycle now continues with Step 1.

roof conditions in the same length of time it takes to move a standard face conveyor under good top conditions where all the timbers can be removed. To make the move, only two of the timbers have to be moved and replaced. These are the ones along the side of the room pan line on the side of the face conveyor.

An example of how the new face conveyor is used at Jewell Valley is shown in the accompanying illustration. The thin coal seam requires close timbering and close roof control to prevent accidents. Ordinarily a lot of drawslate has to be handled but is being held up now. We are using the face-step method of working the wide rooms. Many mines use this step system in various forms. These steps can be varied to suit conditions, manpower, equipment, etc., at each individual mine.

EQUIPMENT AND RESULTS

Equipment for two places (as many places can be worked as desired) is as follows:

2 300-ft room chain conveyors.
2 28-ft 61 HG Jeffrey face conveyors.
2 Shortwall cutting machines with 7½-ft bars.
2 Handheld electric drills.
1 200-ft mother-line chain conveyor.
1 Loading elevator.
1 Car-spotting car hoist.

The crew for two working places totals 11:

8 Facemen, 4 to each place	8
1 Boomman	1
1 Utility man, rock dusting, supplies, clean-up coal dust, etc.	1
1 Foreman	1

Performance can be summarized as follows:

Shift output, tons per place	60
No. men in face	4
Tons per faceman shift	15
Loading time, per cent	42
Available shift time, minutes	430

Note: Maximum loading rate is attained when the four men are placing coal on the conveyor at the same time.

In conclusion, I would like to point out that this method of mining is very desirable where there are bad roof conditions. Even under such conditions, we get results equivalent to what we formerly got with the best. Face-conveyor moving time has been cut to one-third what it was under bad roof. We timber and hold drawrock that we formerly had to take down and handle. We feel that we have increased the safety of the face miners considerably.

We have greatly increased profitable labor at the face because the miner can be loading coal instead of handling drawslate and moving and resetting safety and permanent posts. The face conveyor can be more easily moved about because of the short sections and the use of rollers on the drive. Whenever a miner has to move several timbers in a place, the other miners stop work, listen for roof sounds, get in the clear in case of a roof fall, and thus lose considerable production time. This method of close and permanent timbering reduces such lost time to a minimum and results in greater efficiency.



CENTRAL PLANT FOR TRUCK MINES will be Esco No. 10's role when original mine (top left) is exhausted. Aerial tram carries coal across valley.



FROM TRUCK DUMP HOPPER on highway at right to preparation plant at left, valley is spanned by aerial tramway. White line shows position of track ropes.

CONTRACTING TRUCKER draws a load of raw coal at a Bowman Elkhorn mine, one of the group that will keep the Esco No. 10 plant in operation.



Truck Coal Extends Washer Life

Small tracts and truck haulage will keep Esco No. 10 plant shipping 2,000 tons per day after mine produces last coal. Truck mines mechanized, with continuous machine at one operating in lifts.

WITHIN A YEAR the last mine car of coal will be hauled out of Esco No. 10 mine of the Utilities Elkhorn Coal Co., Esco, Pike County, Ky. Then, however, as now, the well-equipped preparation plant will continue to ship coal at the regular rate of 2,000 tpd for an indefinite period. Looking forward to this time, when the original 1,000-acre tract will be depleted, officials of the company decided to utilize the Esco central plant to process coal transported to it by truck.

In the Big Sandy-Elkhorn district of eastern Kentucky, tracts of coal large enough to attract a railroad and justify building an efficient washing plant are difficult to obtain. However, there are smaller tracts awaiting operators. The Utilities Elkhorn Coal Co., of which J. E. Bowman, Pikeville, Ky., is president, has leased substantial acreage within truck haulage of Esco and is now processing 2,000 tpd. A Joy continuous miner is the producing unit at one of these mines.

Esco No. 10, which shipped its first car of coal Dec. 7, 1941, is in the Elkhorn No. 3 seam, 700 ft higher than the railroad. It was one of the first mines of the district to be operated with mobile loaders and shuttle cars, and to be equipped with a Baum jig and air tables (*Coal Age*, September, 1942). At that time Mr. Bowman was vice-president, R. A. Hedland was general superintendent, and A. O. Coleman was superintendent at Esco. Mr. Hedland is now general manager, J. E. Green is general superintendent, and Mr. Coleman superintendent of High Point No. 1 mine.

To move the truck coal to the cen-

tral plant from a convenient truck-dumping point on U. S. Highway 23, which is on the hillside across the creek from the plant, a single-bucket aerial tram was installed. It is 300 ft long, elevating the coal 30 ft to the surge hopper into which the retarding rope-and-button conveyor from the original mine discharges.

Truck dumping facilities accommodate flat-bed swing-endgate trucks. They back onto a platform which tips by gravity and is controlled by a band brake on the end of an overhead drum around which the platform wire ropes are looped with several turns (see p 112 of this issue).

Delivering to the Esco plant is the Bowman Elkhorn Coal Co., which went into operation in March, 1951. Reserves to this cleaning plant are virtually unlimited when handled by truck. This reserve, No. 3 Elkhorn, is the principal metallurgical coking coal in the vicinity. This mine is operated with Joy loaders, shuttle cars and a belt.

CONTINUOUS MINING DONE IN THREE LIFTS

Bowman Elkhorn has recently opened a new drift using a Joy continuous miner delivering to shuttle cars. With it a new scheme is being tried in handling the parting, which consists of 9 in of soft shale 24 in above the bottom in a 60-in seam. On the first swing across the face the continuous miner takes only the bottom 24 in. On the next swing it takes only the 9-in parting. It is planned to try gobbing this waste material along the rib.

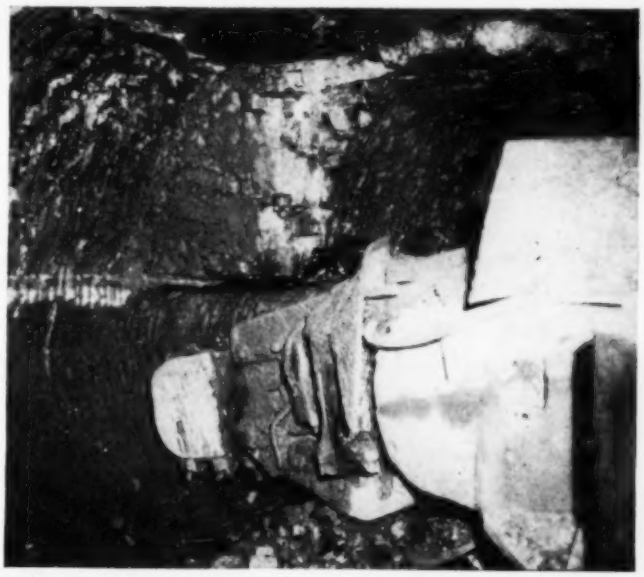
On the third swing across the face the machine gets the top 27 in of coal. This procedure results in a surprisingly large percentage of lump, although the machine has the original-type chain head. High-pressure sprays are used on the unit, the water being supplied through a Joy-Bean pump operating at 400 psi. At present, the miner discharges directly into shuttle cars. Later the coal may be discharged to the floor and picked up by a 14 BU loader already at the mine.

Trucking is contracted and the coal is hauled principally over paved highways and from within a 5-mi range. For moving coal from the hilltop areas in the vicinity this is far more economical than extending tram roads from the No. 10 mine, now nearing its finish.

Similar central plants are becoming more generally used because of the high cost of constructing railroads and tram lines, whereas the cost of operating and maintaining trucks in coal haulage is decreasing and at the same time better roads are being built.



HIGH COARSE-COAL PERCENTAGE is one result of mining the face in three lifts or benches with continuous machine.



PARTING REMOVAL after removal of the bottom bench constitutes one of the three steps in mining in lifts or benches. Parting thickness is 9 in.

OPERATING HEAD—J. E. Bowman, president of the Bowman companies, in his air-conditioned office in quarters recently remodeled in Pikeville.





VISIT TO ARMCO HEADQUARTERS, Middletown, Ohio, features every foreman's training. Foreman M. H. Helmick (rear), Mining Division, takes tour with foremen from other divisions. It's one big step in Armco's plan for . . .

Helping Foremen Grow

This is the story of training at Armco. It tells . . .

How to get foremen on the management team
How to boost the quality of foremanship
How to help a new foreman get his bearings
How to steer miners toward self-improvement

By ALEX KELEMAN, Training Advisor
Mining Div., Armco Steel Corp.
Montcoal, W. Va.

COAL HAS LONG BEEN ACCUSED of not keeping its first-line supervision—the section-foreman level—informed about its place in management or the industrial picture as a whole.

That accusation may have been true at one time. We do not think it is true today. Many companies are conducting management-training activities to bring about this understanding.

In the Mining Division, Armco Steel Corp., Montcoal, W. Va., we saw the supervisory problem some years ago. We determined our needs from an open-minded study of our own problems. Then we worked out a program for our supervisors that puts them where they belong. They now are full-fledged members of our management team.

From the outset, we saw we could follow either of two training methods.

We could follow a haphazard method. That would require no planning and would be easy. Under it, our supervisors would learn the hard way—by trial and error. That way, we would have accidents in our mines and shops, bad work habits and low morale among our foremen and miners, and waste and slow arrival at peak production showing up on our cost sheets.

Or we could follow a systematic plan. This would require real effort on the part of our management. But it gave promise of a reduced accident rate, good work habits, high morale, minimum waste and fast attainment of peak production.

Either training method would cost money, we admitted. We picked the one that would pay dividends.

With our studies pointing up our needs, we developed two training programs and beamed them at our first-line supervisors. These programs were our own "Management Development Program," which we have revised and added to from time to time, and the National Association of Foremen's "Code of Ethics." Besides these, we have worked out programs for training new supervisors, breaking in safety inspectors and helping rank-and-file miners to prepare for supervisory jobs.

HOW OUR MANAGEMENT PROGRAM WORKS

THE AIM OF OUR MANAGEMENT DEVELOPMENT PROGRAM is to give our supervisors a better understanding of their place in the management organization, tell them about our company and our products, and teach them, first-hand, more about our company policies.

One feature of this program is a week-long visit by each of our supervisors to the general offices of our company at Middletown, Ohio. There, with supervisors from other Armco divisions, he spends some 2 hr in friendly discussion with each member of our executive management, including the president and the chairman of the board. They discuss company policies with him and, by their personal approach, show him that policies are more than words—they are a guide for conduct for everybody in the company from the top men down to the rank-and-file worker. He spends the rest of his week touring our Middletown operations and talking with his fellow supervisors from other divisions of the company. This way, he learns what other men in our company do and make and how his own job fits into the company's over-all operations.

One of the local courses within our Management Development Program is called "Knowledge of Responsibilities." We developed it at the request of our supervisors. It is a 20-hr course conducted in ten 2-hr sessions. The objectives of the course are to:

1. Outline the fundamentals of supervision.
2. Improve the quality of leadership.
3. Give the supervisor a knowledge of his responsibilities.
4. Provide the supervisor with suggestions to help him fulfill his responsibilities.

Another course seeks to improve a supervisor's ability to run a safety meeting successfully. Like other courses, it arose out of a need that we discovered. Here's how it came about. Several years ago we started up a series of weekly safety meetings conducted by our supervisors for crew members at the working face. From the start, some foremen were able to make these meetings interesting and effective. But other foremen were not. They couldn't bring crew members to take part in the discussions and they

had trouble selecting topics that would fit into the 15 min allotted to these meetings. Usually, the subjects they chose were general and broad—haulage, timbering, blasting, safety and other sweeping subjects.

We saw that if our safety meetings were to do any good we would have to help our supervisors take the meetings in stride. To meet this need, we set up a course called "How to Conduct a Safety Meeting." It was a 5-hr course broken down into 1-hr sessions. It showed the supervisor how to conduct his safety meeting, helped him select a pin-point topic from materials provided by our Safety Department, and gave him fresh ideas about getting group participation from his men. Now he can go into his safety meeting with a subject that fits into 15 min—coupling mine cars, for instance—and his conference-type meetings provoke lively discussion.

TRAINING SAFETY INSPECTORS

Four years ago we started a course in safety-inspector training. Our aim was to make the supervisor more safety conscious and to help him fulfill his responsibility for creating working conditions that are both good and safe. In this course, we assign the supervisor to the Safety Department for 4 wk. During the first 2 wk he receives full-time instruction in safety fundamentals, safety-teaching methods and safety-inspection procedures. During the second 2 wk he makes actual safety inspections in our various operating departments. He follows up his inspections with the supervisor of the department in which the inspection was made. Training in our safety-inspection course is on an individual basis and is conducted by our safety engineer and our company mine inspector.

A new course completed only recently is called "Plug the Leaks." We had a six-fold purpose in this course, as follows:

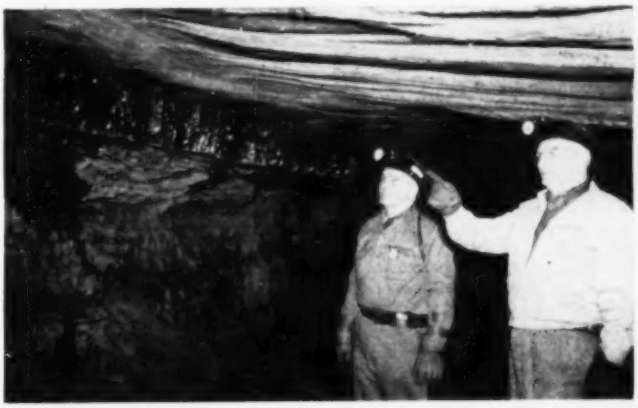
1. To help each management man understand the source and use of the sales dollar.
2. To help each member of management become cost-conscious.
3. To make each supervisor think in terms of money every time anything happens.
4. To show our management the many serious leaks that add unnecessary costs over which a supervisor can exercise some control.
6. To spur our supervisors to take the necessary action to plug the leaks.

To set up this course we had to give our management men a lot of information on the costs of labor, materials, machines and property, plus data on our production performance

Safety is a prime training goal.



LEARNING THE MINE MAP—Safety Inspector W H. Jayne tells trainee Pete Burdiss what the mine map shows about workings and hazards.



WATCHING FOR HAZARDS—"Brows are dangerous and must come down," Mr. Jayne tells Mr. Burdiss as they make a two-man inspection.



LEADING A MEETING—Foreman Dennis Hall (left) learned to run his safety meetings effectively, fast and straight to the point.



PARING COSTS—Superintendent J. F. Trusley, Nellis mine, traces a ton of coal from face to railroad car.



KEEPING MACHINES FIT—Maintenance Superintendent S. P. Carter shows foremen how to repair a breakdown.

Training covers the field for old hands and new men.

and our sales dollars. All this led us into a still broader field, with the result that we created a new course for discussion of certain major features of our American economic system. That's what we called the new course—"Our American Economic System."

Meanwhile, we found that our cost picture was changing from month to month. With this in mind, we have added a follow-up monthly meeting for all our supervisors. At these meetings we show data on costs and production for the previous month and trace a ton of coal from the solid face to the railroad car, adding in the various items of cost as the various production steps—cutting, shooting, loading and so on—are performed. Now, with these three courses, we believe we have a three-fold coverage of economics that helps our supervisors analyze, examine and think about operating costs and points up for them the factual story of our free-enterprising system.

ROLE OF FOREMEN'S CLUB

OUR SECOND PROGRAM for supervisors is conducted as an activity of the Foremen's Club. The program was developed and is sponsored by our local chapter of the National Association of Foremen and is governed by the N.A.F. Code of Ethics. It adds up to an 8-hr course given in six sessions.

Here are the objectives of our Foreman's Club program:

1. To help the supervisor think more clearly about his responsibilities and create in him the desire to keep on learning so that he can measure up to those responsibilities.

2. To give the supervisor a scorecard by which he may check his own standing in the achievement of his professional goals.

3. To make the supervisor conscious of greater needs for training. As this is accomplished, he will make his own outline of needs and will not have to be "sold" on self-development.

4. To make the supervisor feel that he is a real part of management by closing the gap that so often exists between first-line supervisors and other management echelons.

One welcome result growing out of the activity of our Foreman's Club is this: Every supervisor in our organization today knows that he is a management man in full standing.

HOW WE HANDLE NEW FOREMEN

HOW MUCH SENSE WOULD IT MAKE if a doctor had to invent every drug he prescribed?

How much sense does it make to burden a new supervisor with problems that somebody else in the company can help him solve?

Yet some coal companies, when they have an opening, tell a man to stop at the mine office on his way to work, ask him if the West Virginia Department of Mine has certified him and, if it has give him a time book and whatever else he needs and announce that he is to be the foreman in a certain section. They assure the new foreman that everybody is pulling for him and thinks he will do a good job from scratch, with everybody watching him.

Here at Armco, we don't put new supervisors to work that way. We don't believe a man has to work 10 yr in a mine to get 10 yr of experience if others pass some of their experience along to him. That adds up to training, and it's why we require training of all our new supervisors, for their sake and our company's sake as well.

We have combined a careful selection program with a development program to bring competent men into the first line of supervision and to train them during their first year. We aim to speed and stengthen their development. Our plan provides a guide for their induction into the management organization at the time of their appointment and prescribes the basic supervisory courses in which the new men should participate during their first year.

A new Armco foreman is a busy man for his first five days—and for a long time after. Here's what he does in his first week:

FIRST DAY—In the office of the department superintendent and general foreman, our new foreman is notified of his appointment; is given a chance to accept it or turn it down; is told about his safety, training and production responsibilities; and is

★ ★ ★ ★ ★

It's a Fact

You can fool some of the people all of the time . . . and if you're not careful you'll be one of them.

The world has become so small that almost every nation is in reach of Uncle Sam's pocket.

★ ★ ★ ★ ★

given the facts on salary, hours and lines of authority and responsibility. Then he moves on to the office of the assistant to the manager of our Mining Division.

The assistant to the manager ranges over a wide field in his talk with the new foreman. He leads off by explaining that the new foreman now is a member of the management team and telling him how management picked him for supervisory responsibilities. To point this up, he goes through the new foreman's personal record, mentioning service with the company, job assignments and other recorded notations covering training, family status, sickness, merit ratings and so on. Stressing the importance of personal relations, the assistant to the works manager explains our company policy, explains the relationship of the new foreman to our staff groups—safety, training, medical, police, fire and others—and tells him whom to call on for help if he has trouble with the union contract. After urging the new foreman to continue his training and self-development he takes him into the office of the Mining Division manager.

The manager, sketching in the relation between the mine and plant and the larger Armco organization, points out the new man's place in the Mining Division organization and tells him what his new responsibilities are—directing and developing his part of the organization, maintaining quality, improving the cost structure, improving methods and equipment, maintaining safety, applying company policies and rules and playing a role in the community. The manager makes a great deal of the fact that our company's policies, first written down in 1919 and substantially unchanged since then, have stood the test of time and still are reliable guides to conduct. Finally, the manager presents the new foreman with a booklet containing our policies, plus a pass card that identifies our new man as a management man.

After the manager finishes, the training adviser takes over. He urges the new supervisor to continue his own training and to develop his crew into a team, explains the relation between the crew and the Mining Division's over-all operations, discusses the services and functions of the staff departments and shows how the company's policies can be applied in everyday experience.

SECOND DAY—Throughout his second day, our new foreman is with the training adviser. The training adviser takes him on a complete tour of all operations, including the mine, the preparation plant, the shops and supply rooms and all other installations



MR. KELEMAN: "Training is a constant, never-ending job."

of the Mining Division. Everywhere, our new man is introduced to other supervisors.

THIRD, FOURTH AND FIFTH DAYS—Our new man studies our staff groups for the remaining three days of his first week. In each department—personnel, safety, accounting, engineering, purchasing and stores and maintenance—the department head tells him the complete story. In the personnel department the new supervisor has explained to him the details of employment procedures, insurance, compensation, pension plan, hospitalization, medical care, training, housing and the activities of the Armco Association. The safety engineer tells him about the functions of the safety department, mine inspections, causes of accidents, accident-prevention methods, standard practices and the influence of good working conditions on safety morale and production. The accounting department head discusses cost-accounting, record-keeping, timekeeping and payrolls. The chief engineer tells how new projects are originated. In the purchasing and stores department, the new foreman sees the grades and types of materials and equipment kept on hand and learns about their cost. In the maintenance department, he sees how maintenance and repair work is done and gets a clear idea of the relation of the maintenance department to the operating and engineering departments.

BRINGING NEW AND OLD FOREMEN TOGETHER

After our new supervisor gets through his first week, he launches into a series of training courses that stretch out for 6 mo to a year ahead of him, depending upon conditions that may govern his speed. In going through these courses he studies and works alongside foremen of longer standing, who also are studying for self-improvement. In our training office, we keep a chart that shows how far each of our supervisors—old and new—has advanced toward completion of the courses available.

All together, we offer our supervisors the following courses, some developed by our own company and others from outside sources, as noted:

U. S. Bureau of Mines
1. First Aid.
2. Accident Prevention.

West Virginia University
3. State Mining Laws.

National Association of Foremen
4. Code of Ethics.
5. Club Officer Training.

Training-Within-Industry Foundation
6. Job Instruction.
7. Job Relations.
8. Job Methods.

Armco Steel Corp.
9. Armco Policies.
10. Union Contract and Labor Laws.
11. Federal Safety Code.
12. Supervisory Safety Training.
13. Armco Organization.
14. Plug the Leaks.
15. Our American Economic System.
16. Engineer Induction.
17. Knowledge of Responsibilities.

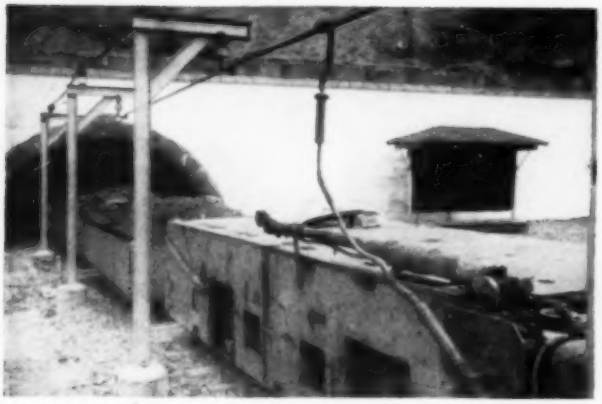
HELPING MINERS MOVE UP

OUR RANK-AND-FILE TRAINING has not been as extensive as our program for supervisors. But we are gradually increasing our training of miners. Their program is on a voluntary basis. Even so, their response has been good and their enrollment holds up well. We try to make it clear to them that they will benefit as much by training as the company will.

Our program is being developed to fit proven needs. The aim is to provide a miner with a new skill or to improve a skill he has already.

Along this line, we have developed and are conducting a "Burners" course to help trainees understand and use the acetylene torch. The course totals 16 hr in eight 2-hr sessions. We offer also a course in maintenance. This puts the trainee to work assembling various types of electrical equipment. It is altogether a demonstration-type course, encouraging the man to practice until he can do the work alone. Other subjects we make available to our rank-and-file men are electrical blueprint reading, maintenance materials and lubrication.

To keep before our supervisors a clear-cut awareness of their management responsibilities is a constant, never-ending job. It requires patience and perseverance. While we are taking one step, we must plan the next step. There are many steps yet to be taken.





MAIN-LINE SET-UP—position of the slide on the inverted trolley as the locomotive brings out a trip is shown at the left. At right is plug connector which pulls loose if the slide hangs on the wire or jumps off and drags on the bottom.



NO NIPPING required with cutting machine. Slider merely stops at room neck and cable pays off reel.



NO SHIFTING TO POLE as locomotive leaves room. It keeps going and slider is pulled after it by cable.

Inverted Trolley Promotes Safety

With 3 yr of experience and 4 mi of inverted trolley in use, Cannelton saves time and promotes safety by eliminating trolley poles and nips.

EXTENSION of the inverted trolley system is continuing in Lady Dunn No. 100 mine of the Cannelton Coal & Coke Co., Cannelton, W. Va. The system got its first trial over 3 yr ago coincident with driving the main haulway from the outcrop. Even with the somewhat crude inverted hangers, inverted frogs and trolley sliders made locally, the system, which eliminates nips and trolley poles, demonstrated its safety advantages from the start. Troubles have been encountered, but the system was continued in use as improved parts were developed and installed. Now 14,800 ft of the inverted trolley wire is in use underground and 6,000 ft on the outside haul and in the mine yard.

The slide consists of a contact shoe on the end of an offset flat conductor attached to a fiber insulating handle. The shoe is connected to the flat conductor by a pivot which permits the insulating handle and its lead cable to hang at a natural angle without tipping the shoe longitudinally on the wire.

On main-haulage locomotives the lead cable of the slide is attached by a push-pull receptacle and plug. The latter is fastened to the locomotive by a pivot so that it will align with the cable pull for travel in either direction, and also permit the plug to pull out if the slide catches on a trolley frog or jumps the trolley and catches as it drags on the bottom. On cable-reel locomotives, mining machines and the like, the plug and receptacle are not used because tension is required to unreel a cable, and if the slide

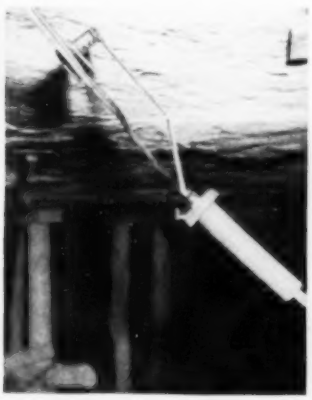




FROGS FOR THE INVERTED SYSTEM—a right-left unit in the mine yard appears at the left, with a left-right unit in the mine at the right.



HANGERS are installed under the wire in the inverted system.



SLIDER BECOMES HOOK as cable pays off reel in the mine.

hangs up when tramming along the trolley line all that happens is unreeling of the cable.

INVERTED-TROLLEY ADVANTAGES

J. S. Kern, who is general foreman of the mine and has had more experience than anyone else with the inverted trolley wire, points to many advantages. Chiefly, elimination of trolley poles from both main-haulage and gathering locomotives has removed a substantial physical hazard. Thus, there can be no accidents from: (1) back poling intentionally or as a result of a trip getting way on a hill, (2) trying to turn a pole, and (3) standing in the cab to put a pole back on the wire and being caught by a low roof or crossbar.

Better electrical contact with the wire and less arcing with the inverted shoe than with trolley wheels or gliders on poles is another advantage cited by Mr. Kern. Wires and shoes last longer because there is less pressure and because it is necessary to lubricate the wires more often. Lack of lubrication may cause the shoe to jump off the wire or not take the frogs as well.

Safety is the principal advantage gained by substitution of inverted shoes for nips on gathering locomotives, cutting machines, loaders, etc. However, maintenance also is reduced and there can be a time saving in travel in and out of room necks. The common type of accident, where a motorman is caught and perhaps jerked out of the cab by a cable as a result of a hung nip, is eliminated.

Machines traveling by electrical contact from the shoe to the inverted wire get a steady flow of power and are not subjected to the terrific jerking that usually takes place when the nip is used and the controller left on an advanced point. Therein lies a maintenance advantage. Saving the cost of nip renewals is another advantage to be considered.

MINE LAYOUT IMPROVED

The inverted trolley wire requires that the mine be laid out so that the trolley wire is always on the same side of the track and the clearance side always the same. Mr. Kern maintains that this layout makes a safer mine regardless of whether the inverted trolley system is used.

Perhaps it should be explained that when a gathering locomotive or machine turns off into a room in which there is no trolley wire the operator pays no attention to the slide. It stops opposite the room neck, then tilts as the reel pays out the cable, remaining on the wire in a hooked position. Likewise the operator pays no attention to the slide when coming out of the room. It automatically changes from hook position to the vertical sliding position.

A mine with high cars operating in low coal is seen as a natural for the inverted-trolley system, because the wire can be installed farther to one side of the track than when trolley poles are used, thus avoiding contact with the tops of the cars.

When first installed at the Lady Dunn No. 100 mine, the inverted wires were spliced with standard splicers turned upside down. The shoes did not ride over them satisfactorily. Therefore, it was necessary to develop a special splice, which is now in use and performing satisfactorily.

FROG DESIGNED IMPROVED

One difficulty not completely overcome is the occasional failure of the shoe to follow the turn on a frog. This difficulty is, of course, not foreign to the standard trolley system, either, as indicated by the number of times a motorman can be seen holding the pole over at a frog.

Designs of the inverted frogs have been worked out for fairly satisfactory performance. According to Mr. Kern, the need now is for a stronger frog to resist distortion. Four types of frogs are required for a mine. Assuming the trolley wire is on the left of the track, looking inby, a left-left frog is required to turn left and a left-right to turn right. At the inby end of a side track on the left side looking inby, a right-right frog is required, with a right-left frog at the inby end of a side track on the right side.

The Elreco Corp., Cincinnati, has acquired exclusive rights to manufacture the line materials for this inverted-trolley system.



THESE TRUCKS efficiently make payload hauls of 216 ton miles after . . .



THEY WERE repowered with supercharged 300-hp engines for the job.

Repowering for Better Stripping

Enos Coal Mining Co. bought six new engines. The six engines added new and necessary power to six tractors and two draglines—and there were two engines left over to permit scheduled overhauls. Here's how the trick was done.

THERE'S MORE THAN ONE WAY to skin a cat, the old adage says. Likewise, when stripping equipment is faced with heavier duty it is not always possible to replace the equipment; nevertheless, there are ways of meeting the new and bigger demands. Enos Coal Mining Co., Oakland City, Ind., faced such a problem when the opening of new pits increased the haul to the cleaning plant to about 12 mi, round trip.

The company's haulage fleet consisted of six Mack tractors with 36-ton Austin-Western trailers and eight 50-ton Dart tractor-trailer units, the latter being more recent additions to the fleet and already equipped with 300-hp diesel engines. The other tractors had 200-hp diesel engines, however, and production suffered somewhat when these units were faced with the longer haul.

Among the alternative solutions were (1) buying larger units with the same speed, (2) buying faster units of the same capacity or (3) "souping up" the otherwise suitable tractors already on hand. Because the tractors were in such good condition, Enos' management chose the third way as a solution.

Armed with top management's decision, Fred Brammer, maintenance superintendent, started his repowering project with the tractors. First the 200-hp engines were removed

and new supercharged 300-hp Cummins NHRBS-600 diesels, like the engines in the Dart tractors, were installed. The conversion required slight changes in the engine mounting brackets and modification of radiator connections.

The added power increased production by permitting faster speeds, loaded and light, to make up for the increased haulage distance. Fuel consumption is about 5 gal per hour for the Darts and 3 gal per hour for the repowered Macks.

WHAT TO DO WITH SIX 200-HP ENGINES?

At this point, it looked as though Mr. Brammer had six spare engines on his hands. But he had a slot prepared for them because there was another situation at the Enos stripping that called for more power to keep operations in balance.

Paralleling the need for putting more power into the tractors was the problem of repowering two draglines for special work on Enos spoil banks.

The draglines (6-yd Bucyrus-Monighan 5-W's) are called upon to act as extremely fast dozers in working the spoil back from the pit to provide stacking room for the 36-yd Bucyrus-Erie 1050 stripping shovel. These walking units operate on the spoil bank, dragging material away from the edge of the bank as the shovel dumps it. In conventional loading, hoisting and dumping, the original engines were fully adequate. But in this work, the bucket carried one 6-yd load and "dozed" another ahead of it as it was hauled back from the lip of the spoil. The duty demanded more power in the draglines.

The upshot is that Mr. Brammer, shown standing in a repowered machine in one of the accompanying photos, removed the original engines and replaced each of them with a pair of the 200-hp NHB-600's removed from the Mack tractors.

The engines are installed side by side, one slightly forward of the other, and both drive the intermediate shaft through V-belts, as shown. Power for the swing generator is obtained from another V-belt drive which is turned by the intermediate shaft. The engines turn their respective drive sheaves through Cotta 2:1 speed reducers.

In the conversion to twin-engine power, the engine compartment was widened and a exhaust fan was installed at the rear to provide adequate ventilation for the engines and to keep the rear-mounted fuel tank cool.

Now the draglines have adequate power for the work they must do.

WHAT TO DO WITH TWO 200-HP ENGINES?

That leaves two of the 200-hp engines to be accounted for. These two units permitted Mr. Brammer to initiate a sound program of "engine husbandry." The engines were overhauled in the shops and now serve as replacements when in-service units need shop attention. Mr. Brammer now operates the dragline engines on a schedule of from 7,000 to 8,000 hr of operation between overhauls. And a pair of engines can be replaced in two shifts.

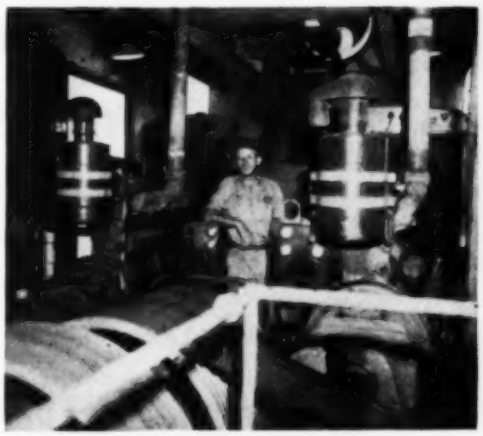
As for the original dragline engines, they had served well and could be retired.

So for the price of six new engines Enos Coal Mining Co. had repowered a fair share of its equipment, with the increased power paying off in higher production and better balance in the operations.

Strip haulage lessons from Enos can be taken to heart since the company is one of the "old timers" in maintaining continuously-operated strippings in the Midwest. Details on full rail haulage, combined truck and rail haulage and full truck haulage from pit to tipple are tucked away in the company's experience file.



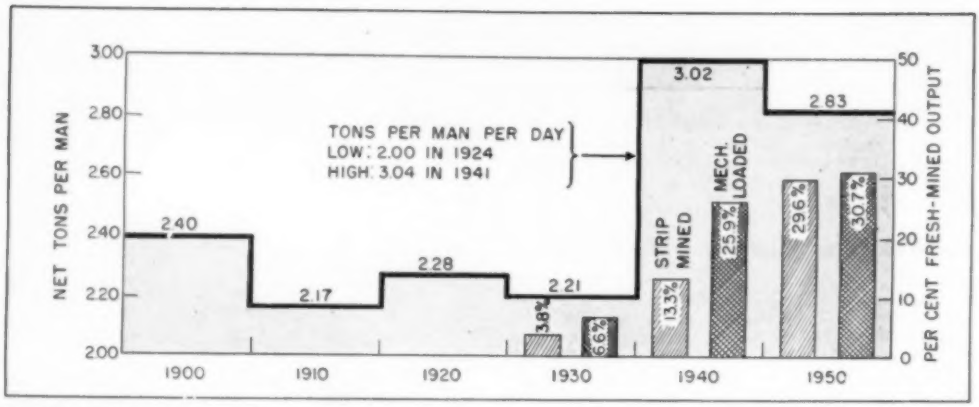
TWO DRAGLINES, for spoil work, were repowered with . . .



TWIN 200-HP DIESELS taken from the trucks, after . . .



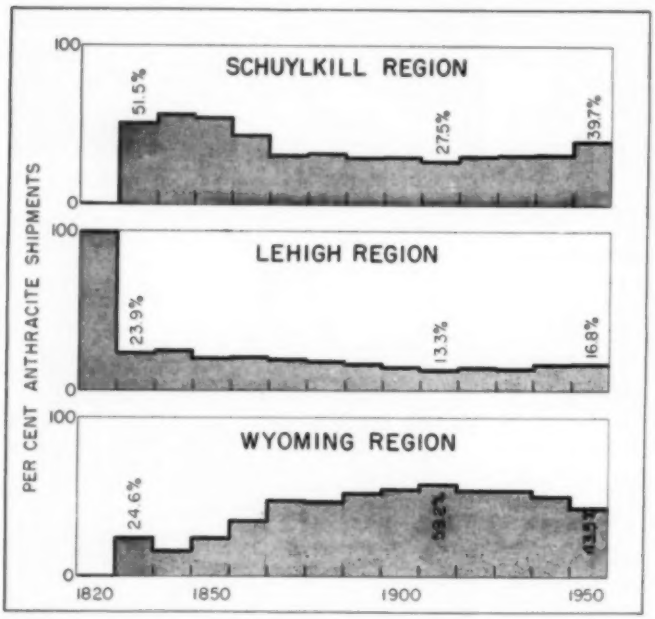
ENGINE COMPARTMENTS were widened to receive them.



MACHINE METHODS have helped anthracite adjust to one of its major problems—keeping costs down. Stripping and mechanical mining underground have reversed the decline in tons per man that started about 1900.

How Anthracite Is Adjusting For Continued Service

Fluidity in some directions and stability in others mark anthracite's past record. New machines, new methods and new outlook called on for future progress.



SCHUYLKILL COMEBACK as anthracite shipper reflects reduced opportunity for low mining costs in other anthracite areas, chiefly Wyoming.

CHANGES in the relative production standings of the various fields, as well as in production methods and sizes shipped to market, naturally have been an inevitable accompaniment of the anthracite industry's efforts to adjust to changes in mining and competitive conditions.

Stability in other directions, however, contrasts with the changes in field standing, production methods and sizes shipped. For example, the majority of the anthracite tonnage still is provided by a hard core of companies that have been in business a long, long time and will continue in business for a long time in the future. Likewise, when it comes to individual mining properties, the greatest share of the tonnage put out by these companies comes from mining operations dating back three, four or more decades.

SCHUYLKILL COMES BACK

Thus anthracite today is characterized by fluidity in certain important respects and relative stability in others. Shifts in the relative standings of the various producing fields are an outstanding example of fluidity. The first shipment of anthracite—55 gross tons in 1807—was made from the Wyoming field. In 1820, the Lehigh region took

the lead with 365 gross tons. It held it, however, only until 1828, when the Schuylkill region, which started shipping in 1822, moved out front with 47,284 gross tons, against 30,232 for Lehigh.

The Wyoming region, after the initial 55-ton shipment, did not reappear in the shipping columns until 1829 (7,000 gross tons). After that, it began forging ahead rapidly, overtaking the Lehigh region in 1843 and the Schuylkill region in 1868.

Inherently better mining conditions, with attendant cost advantage was, of course, the major reason for the Wyoming upswing, which continued until a little after 1900. In fact, the Wyoming region hit its peak in 1902, when it shipped 61.7% of the anthracite total. At the same time, the Lehigh and Schuylkill regions hit their lows of 11.1 and 27.2% respectively.

The reasons for the reversal of the trend are not far to seek. Intensive mining in the Wyoming field naturally reduced the available reserves and also the veins and areas most favorable to low-cost operation. In addition, water also began to become more and more of a problem, though this handicap is not peculiar to the Wyoming region. With greater reserves and an equal opportunity in mining cost, the heavily pitching veins to the south and west began to loom larger and larger in the anthracite picture.

The Schuylkill region has benefited most from the shift from the Wyoming region. Lehigh, as shown in the accompanying graphs, has shown little change in percentage shipped since the beginning of the century. Both Wyoming and Lehigh naturally have many production years ahead of them, but it is clear that the center of output has shifted to the Schuylkill region, bringing in, among other things, the necessity for development of new machines and new methods for economical production on steep pitches.

CORPORATE STABILITY HIGH

Reflecting both the reduction in the size of the anthracite industry and the decline of the Wyoming region, the last several decades have seen substantial changes in the corporate setup in that region. In other areas, the changes have been relatively less in number and magnitude, though there have been some.

The 1920 edition of the *Keystone Coal Mine Directory*, a *Coal Age* affiliate, showed 13 companies with a production of 1,000,000 tons or more. These were:

Delaware, Lackawanna & Western R.R.
Hillside Coal & Iron Co.
Hudson Coal Co.
Kingston Coal Co.
Lehigh Coal & Navigation Co.
Lehigh Valley Coal Co.
Lehigh & Wilkes-Barre Coal Co.
G. B. Markle Co.
Pennsylvania Coal Co.
Philadelphia & Reading Coal & Iron Co.
Scranton Coal Co.
Susquehanna Collieries Co.
Temple Coal Co.

These 13 companies between them operated 178 mining properties and 23 washeries. All the companies listed in the 1920 directory operated 525 mining properties and 33 washeries.

Million-ton companies listed in the 1952 *Keystone* directory were:

Glen Alden Coal Co. (Delaware, Lackawanna & Western and Lehigh & Wilkes-Barre).
Hudson Coal Co.
Lehigh Navigation Coal Co.
Lehigh Valley Coal Co.
Pennsylvania Coal Co.
Philadelphia & Reading Coal & Iron Co.
Stevens Coal Co.
Susquehanna Collieries Div., M. A. Hanna Co.

Between 1920 and 1951, D. L. & W. became the Glen Alden Coal Co. and absorbed Lehigh & Wilkes-Barre; the Stevens Coal Co. grew into the million-ton class; the G. B. Markle Co. was succeeded by a group of companies; and four organizations—all in the Wyoming region—ceased operations. These four were Hillside, Kingston, Scranton and Temple. In part, cessation of operations by these four reflects exhaustion of reserves and rising mining costs, as previously noted.

The eight million-tonners in 1951, with their affiliates—Shenn-Penn Production Co. and Wadesville Production Co. (P. & R.)—operated a total of 60 mining properties and seven washeries, breakers or central plants. However, between 25 and 30 of the properties held by the million-tonners in 1920 are now being operated by other organizatons.

Of the 60 mining properties operated by the million-tonners in 1951, some 52 are properties that either were in existence in 1920 or are on the sites of properties then in existence. This is further evidence of the stability in producing facilities, inasmuch as approximately 200 of the 241 mining properties—more or less—listed for all companies in the 1952 *Keystone* were properties existing in one form or another in 1920. In addition to mining properties, the 1952 directory shows 45 breakers, washeries and central plants, compared to 33 in 1920.

MACHINES CUT COST

Although anthracite continued to grow in the first 20 yr of the present century and reached its peak with 99,612,000 net tons in 1917, the necessity for increased cost-cutting began to loom larger and larger around 1900. Net tons per man reached its peak of 2.50 in 1899 and then began to slide off to a low of 2.02 in 1914 and 2.00 in 1924. This was a futher reflection of the exhaustion of the more-favorable veins and sites, and led first to stripping and then to mechanical mining or loading underground.

Stripping was one of the earliest methods of mining anthracite and in fact is supposed to have preceded deep mining. In 1915, the first year for which data are available, anthracite produced by stripping totaled 1,121,603 tons, rising to 2,054,441 tons in 1920 and 2,536,288 tons in 1930, still less than 4% of the fresh-mined output. By 1940 as a result of improvements in methods and equipment, the total was 6,352,700 tons, or 13.3% of the fresh-mined output. In 1950, the total was 11,833,934 tons or 29.6% of the fresh-mined production.

Mechanical mining or loading underground apparently dates back to 1912, when conveyors were installed in the Dodge mine of the Delaware, Lackawanna & Western R.R. by David Lloyd. By 1927, the year data were first collected, the production by mechanical mining underground was 2,223,281 tons. The rise after that was steady, reaching its peak tonnagewise in 1947 with 16,054,011 tons or 32.4% of the fresh-mined production. Mechanical output in 1950 was 12,335,650 tons, or 30.7% of the fresh-mined total.

Thus, stripping and mechanical mining together accounted for approximately 60.4% of the fresh-mined anthracite production in 1950, compared to 5.8% in 1927. In addition, the industry looked more and more to culm-bank and river coal to cut production cost. As a result, such coal rose from 4% of the total industry output in 1927 to 9.3% in 1950.

Appreciable success has been attained in keeping production cost down by stripping, mechanical mining and culm and river recovery. Tons per man per day stood at 2.83 in 1950, against 2.50 in 1899 and 2.00 in 1914 and 1924, indicating a substantial increase, especially when differences in hours per day are taken into account. However, 1950 was under the peak of 3.04 tons in 1941. Available evidence indicates that this is largelv a result of declines in efficiency underground. In turn, this reflects in part the reluctance of the underground

miner to exert himself to raise his output whether he is hand loading or using mechanical equipment.

SIZES GET SMALLER

Sizes shipped by the anthracite industry also have shifted to meet changing conditions. In the early days of the industry, big coal was the only thing that was wanted and the fines were dumped, incidentally providing later operators with an additional source of output. Pressure first to utilize the smaller sizes and then to meet oil and natural-gas competition resulted in the development of the magazine heater, the power-plant stoker for fine anthracite and the home stoker. Recently, in addition, the pulverized coal burner has come into the picture as an anthracite consumer, bringing with it the possibility of an enlarged industrial market and new emphasis on the production and preparation of fine anthracite.

Reflecting the early views of consumers on the relative desirability of the various sizes, shipments of chestnut and larger aggregated 76.9% of the total in 1890, and were even higher in earlier years. However, the percentage of the larger sizes was dropping fairly rapidly by 1890 and that drop still continues today, though at a reduced rate. By 1910, shipments of chestnut and larger totaled 58.5%, while shipments of pea and larger, now classed as the "domestic" group, was 69.1%. In 1950, shipments of pea and larger had further declined to 58.2% of the total.

ANTHRACITE TODAY

The record has been made in anthracite and cannot now be changed. Hashing it over is of value only for the indications it provides for action in the future. However, there might be one question: "Has it been a bad record?" If the fact that the industry now is only half the size it was at its peak were the sole criterion, the answer could be "Yes." But viewed from all angles, there is much to be said for the way anthracite has met its problems and is meeting them today.

Managerial inertia and shortsightedness played their parts, but from the vantage point of today they were less important factors than the many others that have influenced the course of the industry. It is hard to see for example how even supermanagement could have done much better with the combination of competition and lack of support by the miners and the public in the region that has characterized the anthracite situation for much of the time since World War I and even earlier. The mere fact that the majority of the tonnage still is being turned out by companies with a long production history is evidence that management has adjusted fairly well to the rather severe changes in conditions in the market and in the industry itself.

Anthracite management today sees its situation, its opportunities and its course about as follows:

1. The industry must produce from what it has, meaning that it must seek new ways of raising its efficiency in heavily pitching seams and in areas previously mined. Stripping has been one answer and mechanical mining in the lightly pitching or flat beds another. Now the emphasis is shifting to a search for mechanized pitch-mining methods. Long-hole drilling is one example.

2. The industry must have more assistance from the miners, the union and the public in promoting efficiency. Even now, a real effort on the part of the miner could benefit both himself and the industry by cutting cost and thereby increasing anthracite's competitive power, particularly in the industrial market now opening up and in others that may be created by research. Certainly, this increased effort —meaning a fair day's work by all men instead of only part—will be essential in the relatively near future when deep mining may be called upon to provide more coal.

3. The industry must protect its existing market by high quality, lowest-possible prices, good merchandising and a maximum of service.

4. The industry must develop new outlets for its product through research, better merchandising and improvements in quality, in addition, of course, to competitive prices. One such outlet already showing prospects of growth is the industrial market, which, if competitive prices can be generally achieved, might become one of anthracite's good bets. Gas making and coking are considered to offer good possibilities for the future, along with chemicals and others.

ANTHRACITE TOMORROW

Where anthracite will go in the future still can be stated in only general terms. The first question might be: "Is it going any further down?" Perhaps it will but the weight of evidence is against that conclusion. There may be mild fluctuations and weather, of course, is always a factor, but it can be stated that the decline in anthracite probably is over. It does not follow, however, that anthracite now will turn around and stage a rapid advance in the other direction, but it can be stated that its prospects for an upward trend in the relatively near future are at least fair, if not good.

This follows from the fact that anthracite has been successful in keeping the hard core of its domestic market, and may be in position to expand in this market in the future through new equipment and new services. In addition, as previously noted, anthracite's industrial, gas, coke and chemical prospects either are improving at the present time or look promising for the future, along with others.

Along with a quality product, good merchandising and good service to consumers, the thing that will really help anthracite in its comeback is low cost. This in turn involves development and further application of modern equipment and methods for efficiency under less-favorable natural conditions, and complete cooperation in cost-cutting efforts by the miner, the union and the public in the area. With these, even though all the difficulties will not disappear automatically, anthracite will truly have a chance to cash in on its opportunities.

Minority Rule? Not If You Get Out and Vote

CAN FREEDOM THRIVE when a minority elects our President?

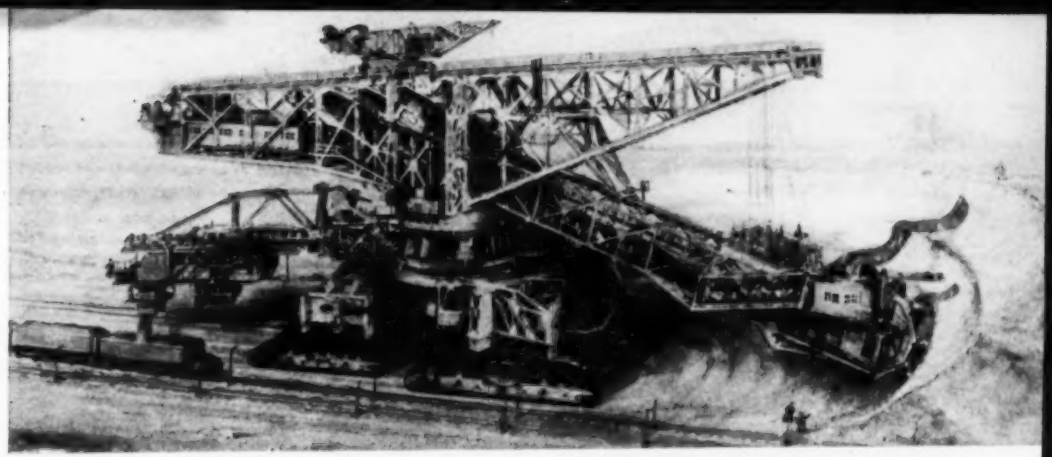
Whether you're a Republican, a Democrat, an independent or something else, you'll agree that our President ought to be elected by the majority of our citizens.

But in 1948, nearly half of our eligible voters stayed away from the polls, with the result that the present administration holds office because one-fourth of our voting citizens cast their ballots for it.

Here are the figures on the 1948 election:

	Votes (Millions)	Percent of Total
Truman	24	25
Dewey	22	23
Others	3	3
Non-voters	45	49
Eligible to vote	94	100

That's minority rule. The outcome might have been the same if more people had voted, or it might have been different. But whether the same or different, it would have been majority rule.



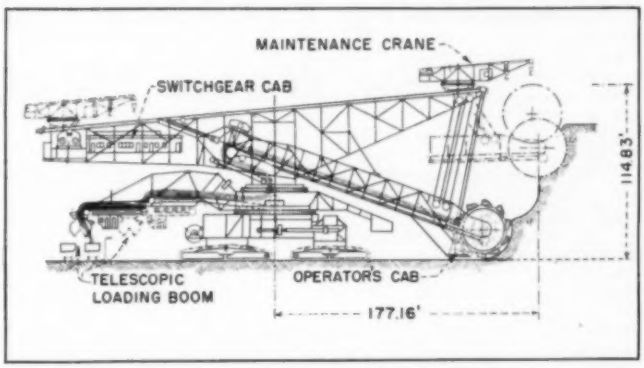
WEIGHING 6,200 TONS, this giant crawler-mounted bucket-wheel excavator, capable of handling 4,578 cu yd of material per hr, is Germany's entry as the . . .

World's Largest Excavator

DESIGNED TO HANDLE 111,176 cu yd of material a day, the bucket-wheel excavator shown above is a German design for low-cost stripping of brown coal, Germany's major power plant fuel. Construction, which began in 1943, was scheduled for completion in the summer of 1945, and the machine was to go to work in the Barbara field of the former Reichseletrawerke A. G., Berlin, to secure fuel for the large Zschornewitz power plant near Bitterfield. By that time, however, the Allied armies had defeated Germany and Bitterfield wound up behind the Iron Curtain, with the result that the machine still remains incomplete as a result of Russian disinterest.

Over-all design and construction of the machine was handled by the Luebecker Maschinenbau - Gesellschaft, Luebeck, Germany, with the electric portion being designed and supplied by the Brown, Boveri & Cie. A. G., Manheim, Germany.

Much of the brown coal in Germany is overlain by glacial till or drift, which makes possible excavators of the bucket-wheel type in addition to the bucket-chain type also shown in an accompanying illustration. This particular bucket - chain machine weighs 1,385 tons and has a capacity of 1,380 cu yd per hour. Bucket-chain machines work on the bank, while the bucket-wheel type operates from the pit. Machines similar to the bucket-wheel type are in service in the United States, but hard rock, not encountered in German brown-coal stripping, limits them to removing the soft top layer in deeper stripping.



MATERIAL FLOW and principal details of the bucket-wheel excavator.



BUCKET-CHAIN-TYPE EXCAVATOR working from bank can handle 1,380 yd per hour.





NOW PROTECTING NEW PLANT, water-neutralizing unit (right) saved $18,000 a year in labor, materials and equipment in original Marriott-Reed plant, in addition to minimizing production interruptions and delays.

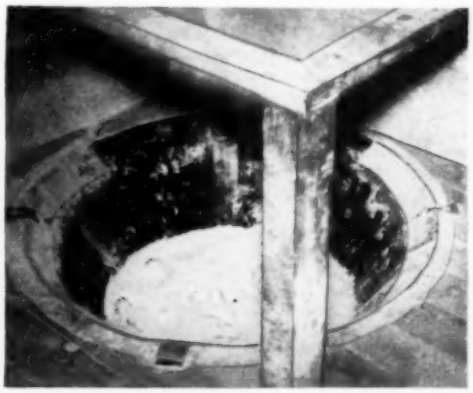
Cutting Preparation Cost By Water Neutralization

How Marriott-Reed beat the acid-water problem and secured major savings through use of a staff-designed neutralizer.

BY WALTER E. MARRIOTT and JAMES E. LINN
The Marriott-Reed Coal Co., Columbia, Mo.

WATER NEUTRALIZATION by a specially developed neutralizing unit, first installed in the company's original washing plant early in World War II and now protecting the company's new plant completed in 1950, started out by saving The Marriott-Reed Coal Co. approximately $5,000 a year on pumps alone. Over the entire preparation plant, we estimate the annual savings in labor, material,





WATER-NEUTRALIZING PLANT features block construction (left) and two-story design for greater convenience, with neutralizer hopper (right) on top floor and neutralizer (far right) on lower floor. The plant is about 400 ft from tipple.

new pumps and the like at $18,000, this for a plant producing around 600 tons per day.

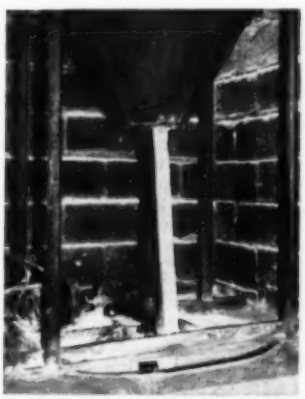
The Marriott-Reed Coal Co. operates a strip mine near Columbia, Mo., mining the 26-in Bevier seam, as described in the December, 1940, issue of *Coal Age*. During that year a new coal washer was installed. The production of the operation at that time was approximately 600 tpd.

Water for the new washer was pumped from a newly built lake of approximately 6,000,000-gal capacity. Sludge from the washer was carried in an 8-in trough to a settling pond where the water was clarified by filtering it through baled straw, the filtered water overflowing to the fresh-water lake. After a period of time the water became acid. This resulted from the fact that we were using a closed circuit, and also because drainage water from coal stockpiles went back into this lake. It is necessary to have stockpiles in the operation of a truck mine, and because of the terrain, they had to be located adjacent to the lake.

ACID WATER EATS EQUIPMENT

After a year or two the water became so acid that we noticed a rapid increase in the cost of maintaining our pumps, screens and the like. The acid water would destroy the foot valves on the fresh-water pump in a very short time. The only way we could keep in operation was to buy new pumps, screens and other equipment, as "hot" water would eat out a pump in approximately 2 wk time. Also, the water problem made it necessary for us to have two night welders in our preparation plant to operate the following day.

About this time World War II started and it became difficult to purchase fresh-water pumps and other repair parts. For a while we were able to operate by rebuilding our pumps with bronze and then machining them, but the water would honeycomb the bronze in a few days. And because of the shortage of material, we were advised by our supplier that the delivery on the type fresh-water pump we were using would be from 8 to 12 wk instead of the 2-wk delivery we had been accustsomed to.



NEUTRALIZING AGENT chutes from upper floor into neutralizing machine.

TREATMENT THE ANSWER

Confronted with this water problem, we sought the advice of H. A. Buehler, Missouri State Geologist. He advised us to have the water analyzed. This we did and found it to have a pH of 3.2. After studying the situation Dr. Buehler suggested that we scatter lime in our lake by means of a boat. We realize that because of rainfall, the fluctuation of our lake would make this method impractical, and also much lime would be wasted.

Knowing that we had to neutralize our water to keep our preparation plant in operation, we (Mr. Linn specifically), came up with the idea of feeding in a neutralizing reagent ahead of the suction pump to protect the foot valves, thereby protecting the entire water system. We then designed a water neutralizer, which consists of a hopper to hold the reagent, a variable feeder to control the dosage and an agitator to mix the reagent with water to form a liquid to be fed in ahead of the suction of the pump. The machine was wired to interlock with the pump motor, making it fully automatic.

The results attained in practice, as summarized in the following paragraphs, led to consideration of a patent application. This was granted and the Water Neutralizing Co., of Columbia, Mo., was organized to manufacture and sell the unit.

We were very fortunate in obtaining a new pump at the time the neutralizer was put into operation. After a few days, we noticed that the spray pipes, which had been lasting two 8-hr shifts, were still in good condition. And after a short time we also noticed that the maintenance cost on the preparation plant and entire water system was greatly reduced.

When we placed the neutralizer in operation we used about six bags of hydrated lime per 8-hr shift. We were then pumping 125 gpm, or 60,000 gal per shift. The lime cost at that time was 50c per bag, making the cost $3 per shift. By treating our water in this manner, we soon changed the pH from 3.2 to 6.2. Since our slurry water was about neutral, after the water left our clarification pond and returned to the lake, the water in the lake became less acid, enabling us to cut down on our reagent dosage.

MAINTENANCE CUT SHARPLY

We dismantled our fresh-water pump for inspection after operating 1 yr with the neutralizer, and found the pump to be in perfect condition.

We estimated the savings to our company on pumps alone to be approximately $5,000. Dewatering elevators that had been deteriorating in 1 yr now lasted 4 yr. Screens that formerly wore out in about 6 wk now lasted about 1 yr. We also discovered that the two tipple maintenance men could be eliminated and replaced with one part-time man who devoted only about 8 hr to the tipple per week. We estimated the over-all annual savings on labor, material, new pumps, etc., to be in excess of $18,000. The operating cost of the neutralizer was practically negligible, it being only about $600 per year.

PUMP PUT UNDERGROUND

In November, 1949, our preparation plant was totally destroyed by fire and was replaced by a new modern plant. While we were in the process of rebuilding we redesigned our pumphouse by putting it underground, thus preventing freezing in winter. We then built a two-story concrete block building adjacent to our tipple to house our neutralizer. The neutralizer was placed on the lower floor, using the second floor to house the reagent. The building was constructed in this manner to facilitate handling the reagent, as indicated in one of the accompanying illustrations. The reagent, after leaving the neutralizer, flows by gravity to the pump sump which is approximately 400 ft away.

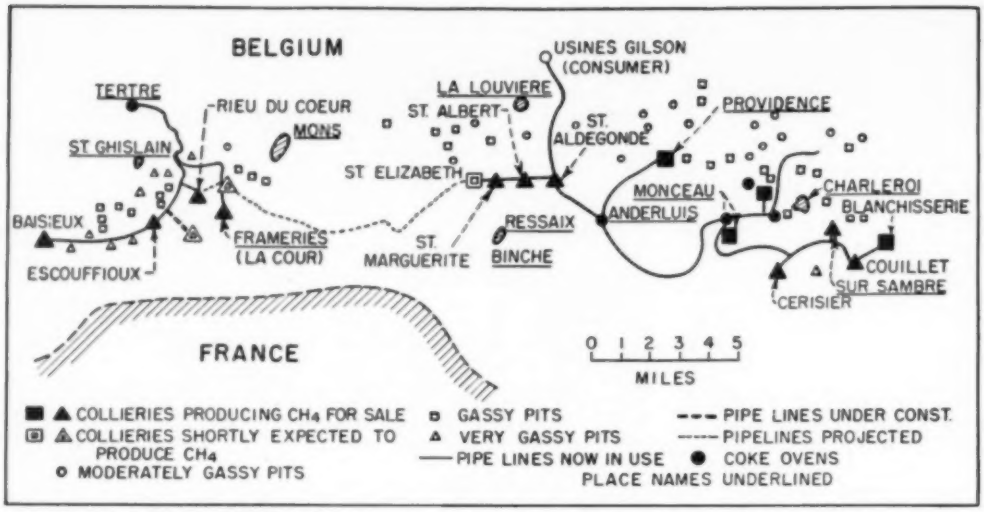
The trend to closed circuits, reflecting in part at least state legislation against stream pollution, is enhancing the problem of checking acid build-up in wash water. Automatic neutralization has provided an effective, low-cost answer for Marriott-Reed. We will of course be glad to share our experience.

★ ★ ★ ★ ★

It's hard to remember after all these years but, believe it or not, this country was founded by men who sought relief from high taxes.

—The Houghton Line

★ ★ ★ ★ ★



EUROPEAN COAL PRODUCERS, such as these in the Mons-Charleroi field of Belgium, cut methane content and get income by . . .

Degassing With Boreholes

Now being tried in the United States, systematic degassing with boreholes promotes safety and brings income abroad. Here is a review of history, methods and results.

By R. G. WUERKER, Assistant Professor, Mining Engineering, University of Illinois, Urbana, Ill.

SYSTEMATIC RECOVERY of methane from mine workings has been practiced in European collieries with increasing success since 1943. The original idea was to relieve the air current and keep the firedamp concentration below the 1:100 ratio of methane to air prescribed by the mining laws of most countries. Later, firedamp as rich as possible was removed by special pipe lines with the intention of using and selling the high-grade methane in areas where such a market existed. This, however, has always been secondary to the question of improved safety.

With the increasing number of installations much knowledge has been gained on the storage of methane in coal seams, and in the strata above and below. New information has been obtained on the rate of degassing, and especially on the influence of roof pressure. Various methane recovery methods have been tried and in almost all cases found to be successful. History and present practice are reviewed in the following material based on European mining literature.

MANSFELD THE FIRST

The history of what is generally conceded to be the first methane recovery, at the Mansfeld colliery in Germany, is an excellent example of the successful solution of this age-old problem (Reference 1). In 1943, the management decided to work the Roettgersbank I and II seams between the 7th level and the top of the saddle, shown in Fig. 1. To establish a ventilation circuit to the sublevel between Levels 6 and 7, a 10.4-in borehole, O, was drilled up from the top of Raise I to connect with old workings.

The hole passed through the Ida and Bluecher beds, but no unusual emission of firedamp occurred. Things changed, however, when working of the seam was started. One longwall face was advancing east in Roettgersbank I (that is, toward the reader) and one west. The upper gangway was running normal to the intersection of the bed with the sub-level; the lower one normal to the intersection of Roettgersbank I with Level 7.

Within a month, when the faces had advanced only 66 ft on either side, a considerable and sustained increase in firedamp was noted. The gas was found to come from Borehole O connecting Raise I with the 6th level. An attempt to plug the hole resulted in the firedamp escaping through cracks in the rock with a sound like a leaking compressed air line. It was decided to drive a 10.4-in steel pipe 8.2 ft long into the borehole and grout it carefully.

The gas continued to escape through the pipe with a hissing sound, but no measuring equipment was around at that time. The pipe line was extended to Blind Shaft No. II from where, for the time being, the firedamp was carried away by the return air. The methane content of the air in the workings and machine chambers dropped immediately.

COLLECTION SYSTEM INSTALLED

A plan was adopted to recover the methane systematically and pipe it to the surface for fuel. A 6.2-in pipe line 8,300 ft long was laid to the surface,

where two exhausters were installed with conventional water separators, filter and measuring devices. The suction at the exhauster inlet was 39.37 in, dropping to 3.9 to 7.8 in at the boreholes.

Routine practice in draining firedamp at this particular mine is to drive boreholes from the upper gangway into the roof closely behind the advancing face. Holes are 100-150 ft. deep (Fig. 1), and follow a pattern found best suited to local conditions. Recovery of a gas containing 60 to 80% methane from one hole lasts on the average, about a year. If it falls below this value, the hole is disconnected from the line.

DETAILED RECORDS KEPT

Daily gas collection at this mine is around 310,000 cu ft containing not less than 70% methane and having a net heat value of 740 Btu per cubic foot. Over the 1-yr period April, 1943, to April, 1944, all boreholes supplied 174,000,000 cu ft of pure methane.

A detailed gas production record during the period shows faithfully all important events. Fig. 2 shows the gas drainage of whatever number of boreholes was active at the time indicated at the bottom of the graph. Here the fortnightly values of the quantity of gas (converted into 100% methane), and the percent of methane in the air are recorded. The quantity of firedamp at the time of first measurement was 350 cfm. It dropped during the first 4 wk to 300 cfm.

Upon installation of the pipe line to the surface the gas drained fell to 168 cfm. Frictional resistance was high because pipe size was too small, thus reducing the free emanation of gas. Upon installation of an exhauster at the surface the quantity of removed gas rose again. Further ups and downs in the curve reflect changes in numbers of connected boreholes, and difficulties in the breaking-in stage of an installation that had no predecessor. The final increase in gas production reflected the starting of production in the Roettgersbank II seam underneath.

The influence of this methane recovery on ventilation was quite marked. Changes in the composition of the mine air along the longwall face advancing toward the east are shown in Fig. 3. The upper graph is the total air circulated; center, total CH_4 removed, either by the air current or by separate pipes. The resultant drop in the CH_4 content of the air current, down to the required 1% level, is shown by the lower graph. It was achieved after firedamp drainage became fully effective about October, 1943.

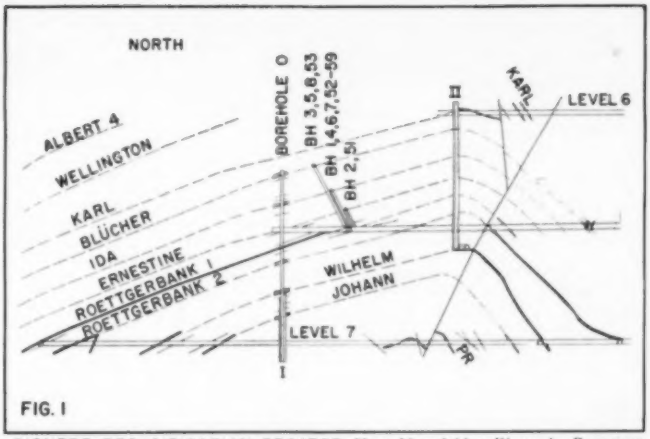


FIG. 1

PIONEER DEGASIFICATION PROJECT. How Mansfeld colliery, in Germany, went about the first systematic degasification experiment (Weddige-Bosten).

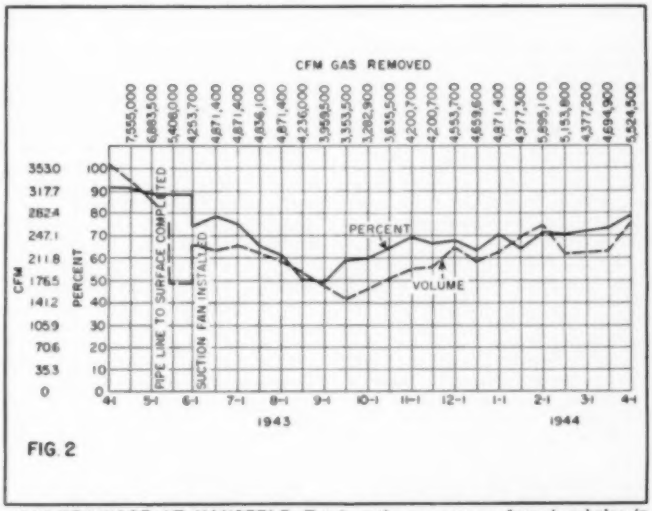


FIG. 2

GAS DRAINAGE AT MANSFELD. Total methane recovery from boreholes in service and methane content of the air, 1943-44 (Weddige-Bosten).

The Mansfeld colliery was for 5 yr the only mine practicing systematic methane recovery. A total of 490,000,000 cu ft of methane has been removed and sold at this pit to the end of 1951.

PROJECTS TOTAL 67

After the war, methane recovery spread rapidly throughout the European coal fields. According to Schulz (2, 3), 67 coal mines had or were preparing similar installations at the end of 1951 (Fig. 4). Coal operators in Belgium and the Saar were especially quick to realize the advantages of planned firedamp removal for the thin, highly gaseous coal beds in their districts. The daily methane recovery in these two areas, in December 1951, surpassed by far the figures for the Ruhr and Aachen, as can be seen from the following table:

	Million Cu Ft
Belgium	7.0
Saar and Lorraine	6.8
Ruhr and Aachen	2.8
England	0.88
Pas de Calais	0.52

The pattern set by the Mansfeld

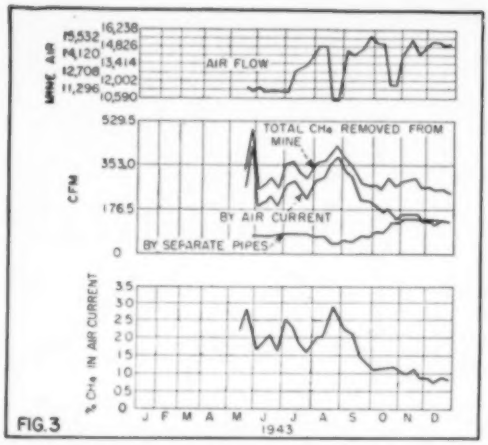


FIG. 3

FACE RESULTS AT MANSFELD. How boreholes degasification affected ventilation along the working face in 1943 (Weddige-Bosten).

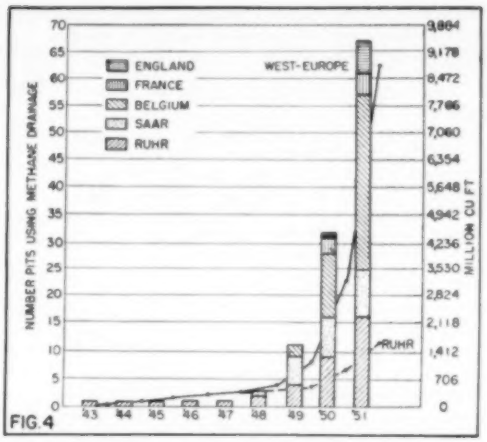


FIG. 4

EUROPEAN DEGASIFICATION DEVELOPMENT. Growth in number of pits using borehole degasification and methane recovered (Schulz).

colliery has more or less repeated itself. Except for a special newly developed drill bit, conventional equipment was used. Besides boreholes driven in the roof of the upper roadway (as described in the foregoing), boreholes have been drilled into the roof from the lower roadway. Holes in the floor of the beds have been equally successful. Separate roadways have been driven in seams above the producing longwall workings (4-7). Closed by dams similar to those of water, they act as collectors for the firedamp. Pipes through the dams are provided to connect with the pipe lines to the surface. There are records of some mines draining from blowers (6, 10) or from gob areas (6, 15), but these attempts are not in the nature of planned degasification by using the influence of mine workings on increased firedamp liberation.

The important features of all these operations, representing new advances in knowledge and technique of removing firedamp, are:

1. Rock and coal become more permeable and permit the methane to emanate more freely upon starting mining. Through the stresses set up in the rock above and below, and in other beds in the roof and floor, cracking takes place, and minute fissures and crevices are formed.

2. Suitable boreholes can capture this methane and keep it from mixing with the mine air.

EUROPE FERTILE FIELD

Systematic drainage of methane is especially applicable to coalfields like in Europe. Mines are not only deeper than in America, but seam is worked under seam. Recovery of very thin beds is typical for Belgium where the CH_4 content is often so high that the permissible 1% content could not be reached. Any unforseen increase very often puts an extreme load on the ventilation system. Resulting high air velocities bring about a considerable dust nuisance. The National Coal Board of Great Britain recommends, for this reason, in rooms less than 3.3 ft in height that the maximum air volume be limited to 1,500 cfm. And since in many countries the mining laws prescribe shutting down electrical machinery and stopping coal recovery until the methane content is down to 1%, it is understandable why so many mines prefer methane drainage to separate pipe lines over letting it mix with the mine air and removing it as firedamp.

Only one mine (4, 5), to the reviewer's knowledge, employs the room-and-pillar system typical of American coal-mining methods. Systematic firedamp drainage here was as successful as at collieries working longwall, and there seems to be no reason why safe methane removal and recovery should depend upon the mining method.

Besides safer and more efficient mine operation, systematic methane recovery has paid its way directly through sale of the high-priced gas at the surface—at least in all instances where there was a market for this type of fuel. The methane recovered from the mine is ready for use without any drying and purification. It is used as follows: (1) under boilers for steam generation (as air has to be added in this case, the CH_4 content of the firedamp can be as low as 30%); (2) as pipe-line gas for existing distribution systems; and (3) as bottled gas.

At the present time, however, methane is sold or otherwise utilized on the surface only in roughly 50% of the existing installations, as this is always secondary to improved safety. With more and more distribution systems prepared, or connections to existing pipe lines installed, it is predicted that this figure will increase substantially. Great Britain, in particular, is making every effort to introduce systematic methane recovery, having the development of a new substantial source of fuel in mind. Anyone interested in the economical aspects of this new development on a nationwide basis is referred to the Joint Report by the Ministry of Fuel and Power and the National Coal Board on the Drainage of Firedamp from Mines (6), and articles by Roberts (8, 9, 10).

AMERICAN METHANE DRAINAGE

In America similar excessive discharges of methane are fortunately rare. Certain beds of the Pocahontas series in West Virginia (11, 12, 24), the anthracite seams in Pennsylvania (17), and the British Columbian coal seams across the border (18), are known to be troublesome in this respect. The following quotation from a paper by Price and Headlee (11) describes one of the attempts to bring heavy gas outbreaks under control by boreholes drilled from the surface.

"The Pocahontas Fuel Co., at its No. 34 mine, while mining Pocahontas No. 3 and 4 beds under Rockhouse Branch of Horsepen Creek, McDowell County, in 1938, encoun-

tered methane gas in such quantities that mining operations were stopped in this area while several boreholes were drilled from the surface ahead of the workings in an attempt to drain the gas off. Gas was first encountered in the sandstone about 80 ft below the surface, the release of which materially lessened the flow of gas into the mine. A total of 500,000 cu ft of gas per day was obtained from four boreholes along a 1,000 foot line . . . Even though these boreholes markedly decreased the gas escaping into the mine, large quantities of gas continued to enter through the floor indicating the presence of another gas reservoir below the seam . . . When these wells were again visited in 1941 they were still producing some gas, and a large quantity of gas was still coming through the floor of the mine."

The history of this project goes back to about 1936, when gas emission from prospect holes and wells, coupled with a major increase in methane production in mining, led to drilling in an attempt to reduce the methane content (13, 14). The early holes reduced the methane content of the return from 1.5 to 0.3%. Some 3 yr later, after mining had advanced some 3,000 ft, gas again became troublesome. Additional holes were drilled and vacuum pumps were installed on two. One pump-equipped well was 5,000 ft from the face but was still effective in reducing the gas content of the mine air. Evidence indicates that at least part of the extra gas encountered came from the overlying rock, part of which was badly broken. Other gas came from the bottom, as noted by Price and Headlee.

Boreholes for drainage from old and abandoned workings which are inaccessible and cannot be ventilated go back considerably farther in the United States. Cunningham and Connor, for example (15), reported on churn-drill holes to bleed off gas in a lower seam at a western Kentucky mine, following an explosion in the lower seam in 1909 in spite of the fact that it was partly filled with water. Three holes were drilled. They served their purpose well, the authors reported. Systematic removal of methane from mines, either underground or from the surface, seems to be possible under a great variety of geological and mining conditions.

The potentialities of using methane from firedamp as a fuel have likewise been investigated for the West Virginia operations (11, 12). However, with the completely different fuel situation in the United States, and natural gas wells next to the coal mines, an incentive for the utilization of the methane will exist only in very special cases. The benefits of systematic firedamp drainage on mine safety normally will be the main objective in systematic degassing of mine workings in the United States. A case in point is the experiment in northern West Virginia announced early in August.

Being conducted jointly by the Christopher Coal Co. and the School of Mines, West Virginia University, the experiment is aimed at providing data on the possibilities of degassing the Pittsburgh and other seams in the area. Two drill holes have been put down from the surface to the Pittsburgh seam horizon. These have shown sustained methane liberation and promise appreciable gas drainage from the seam and the surrounding area.

In addition to normal open-well flow, the program provides for (a) vacuum pumping; (b) pressuring from the surface to determine effect on gas movement; and (c) shooting of holes to see what happens to drainage.

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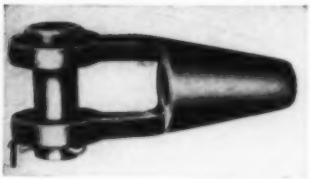
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The Lengthening Tax Shadow

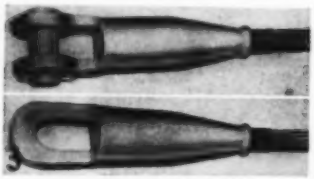
Federal expenditures for the fiscal year 1929 amounted to less than the total income of California's inhabitants. In the fiscal year 1939, these expenditures were equal to the individual income of the Pacific and Rocky Mountain regions, together with that of South and North Dakota and 42% of Nebraska.

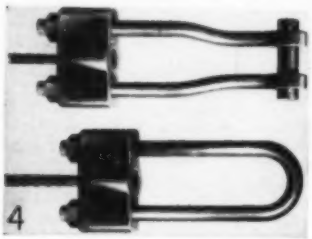
For the current fiscal year ending June 30, 1953, estimated federal expenditures will take the equivalent of estimated income of all people west of the Mississippi River, plus all income of the inhabitants of Mississippi and 55% of those of Alabama. If state and local expenditures were added, the area would be extended to include the remaining portion of Alabama, all of the individual income of the people of Kentucky, Tennessee, Georgia, Florida and South Carolina, and three-fourths of the individual income of inhabitants of North Carolina.

—First National Bank of Boston





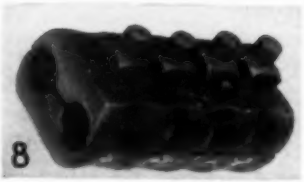






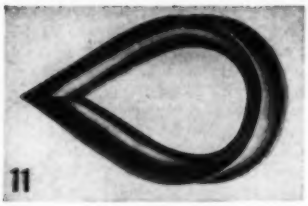


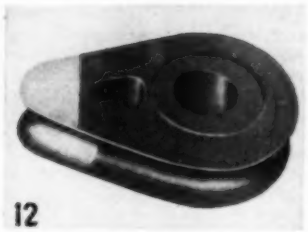


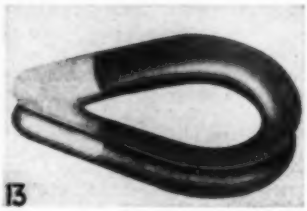




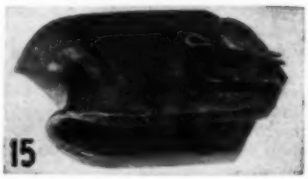












Know Your Wire Rope Fittings

By WALTER C. RICHARDS
Wire Rope Technical Board*

SAFE AND ECONOMICAL APPLICATION of end attachments for wire ropes requires a knowledge of their strength efficiencies and their relative advantages and limitations under various operating conditions.

The so-called efficiencies of end fittings (Table I) refer to security of attachment only. They indicate the percentage of useful rope strength that may be expected at the time of installation. In the table the attachments are arranged with the most efficient at the head of the list.

Then, to determine the available working load, the breaking strength of the rope, as listed in the manufacturer's catalog, is multiplied by the applicable efficiency from the table before dividing by the selected design factor.

However, the static-load efficiencies shown in the table do not reflect the effectiveness of these several attachments under all types of live loading. Therefore, Table II is a suggested realignment that reflects additional characteristics. And this order would change if other factors were considered. All these attachments have given good service in many different ap-

Adapted from an article in *CONSTRUCTION Methods and Equipment*, July, 1952: p 120.

* The Wire Rope Technical Board is composed of engineers and technical representatives from each of the wire rope manufacturers in the United States. Mr. Richards is a member of the board and chief engineer of A. Leschen & Sons Rope Co., St. Louis, Mo.

plications, but some are better suited than others for certain operating conditions.

A description of the fittings in the tables and others and a discussion of their relative advantages and disadvantages follows:

Wire rope sockets may be either open (1) or closed (2), having a tapered bowl into which the rope is secured with zinc. There is a "standard" design for 5-, 6- or 8-strand ropes, and another with an elongated bowl (3) designed particularly for high-strength strand. When carefully attached according to manufacturers' recommendations, these sockets will hold until the rope breaks.

Where vibration is present, however, this rigid attachment acts as a sudden arrestor for the vibration waves and causes progressive failure of the wires close to the socket point. If the socket has been completely filled with zinc, many of the wire fractures will be found on the outside. But in some cases, the breaks will occur within the socket bowl and the condition of the rope cannot be accurately determined. Furthermore, field attachment of these sockets is seldom convenient.

The bridge socket (4) is a variation of the preceding type and is subject to the same disadvantages.

Compression fittings (5) are attachments into which the rope is inserted and secured by cold flowing of the surrounding steel under heavy pressure. When properly attached, these fittings will securely hold until the rope breaks, but attachment is a factory process.

A wedge socket (6) is a fitting with a tapered bowl. The rope is secured in place by passing it around a grooved, wedge-shaped piece of steel and drawing the rope and wedge down into the bowl.

This socket finds wide use, particularly on excavating equipment, as it has the advantage of being readily removable and may be easily reattached in the field. While this fitting will not develop the full breaking strength of the rope, the ropes on which it is used generally are subject to more or less rapid deterioration. Thus the weakest spot in the assembly would be somewhere along the rope rather than in or near the socket. This type socket does not develop the full strength of the rope because of the binding action at the bend of the rope around the wedge.

Vibration is suddenly stopped by this socket also, and progressive failure of the wires results. But it is not quite as severe as with the preceding types of fittings, and the breaks may extend over a greater distance.

TABLE I

Fitting	Efficiency	Fitting	Efficiency
Wire-rope sockets, spelter (zinc) attachment	100%	Clips	75–80%
Compression fittings, swaged or pressed	100%	Spliced-in thimbles:	
Compression sleeve attachment, loop with or without thimble	100%	$\frac{3}{8}$ to $\frac{5}{8}$ in, incl.	90–95%
Wedge sockets	80–90%	$\frac{3}{4}$ to $1\frac{1}{8}$ in, incl.	85–90%
		$1\frac{1}{4}$ to $1\frac{3}{4}$ in, incl.	80–85%
		$1\frac{7}{8}$ to 2 in, incl.	75–80%
		$2\frac{1}{8}$ in and up	70–75%

TABLE II

Fitting	Strength	Resistance to Vibration and Variable Stress	Ease of Attachment In Field	Compactness of Attachment
Sockets	Excellent	Poor	Fair	Good
Compression fittings	Excellent	Good	.....	Excellent
Wedge sockets	Fair	Fair	Excellent	Good
Thimble splice	Fair	Good	Fair	Fair
Clips	Fair	Good	Good	Poor

Many rope ends are attached to their respective anchorages by clips (7) or clamps (8). The rope is passed around a thimble which protects the loop and the short end is clipped back upon itself (9), with a certain number of clips at specified intervals as recommended by rope and clip manufacturers.

Clips usually are of the single U-bolt and saddle type. Clamps consist of a pair of steel castings or forgings with two grooves to match the diameter of the rope and with three or four bolts for fasteners. With clips, the rope is subject to a certain amount of crushing. The same is true of clamps, though they are a little less damaging. In either case, there is a tendency for the rope to slip out of the fittings, if they are not tightened once or twice after initial loading.

The advantages of such fittings are ease of application in the field and their gradual dissipation of vibrations. Progressive wire failures caused by vibrations are not entirely prevented, however, and in certain ropes vibration causes wire breaks under the first and second clips or clamps. In such instances, inspection is difficult.

A similar connection may be made by splicing the end of the rope around a thimble (10). The efficiency of the splice varies with the diameter of the rope, but in most cases it is more efficient than clip attachment. The spliced end is most effective in dissipating vibration and inspection is easier. On the other hand, splicing usually is an operation for the factory.

Thimbles used with clamps, clips and splices usually are standard or extra heavy forged thimbles (11), solid cast thimbles with pinholes for appropriate anchorage (12), and heavy cast thimbles (13). The last are similar to the standard type and are called hawser thimbles.

In addition to the conventional compression fitting, there are special metal sleeves for small diameter ropes that can be compressed around the ropes by special hand-operated tongs. Many logging ropes have a special ferrule type of fitting (14), which is zinced on the end. This is used with a drop-forged hook, eye or shackle. Ferrules may also be fitted with removable wedge inserts which are corrugated to fit the rope. Still other compression fittings may be screwed together or are hinged, and are lined with corrugated inserts to grip the rope.

Another type of fitting, which is a combination thimble and shackle, is the shimble (15). Certain end connections for small ropes are made with a bent wire or rod which is called a screw anchor. The rope is twisted around this bent rod and back on itself, forming a lock. A variation, known as a tailrope hitch, is a forging having an eye or hook at one end which is grooved to receive a rope. The rope is passed around this grooved path in the form of a half-hitch which holds itself under tension.

The foregoing attachments have given good service in many applications. Intelligent selection of the best fitting for the job at hand will result in safer, more economical service.

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3. Apply what you learn to your job.

BEGINNING now and extending throughout the Fall and Winter is the traditional training season. Vacations are memories, the youngsters are back in school, the tomatoes are canned, and perhaps your company is one of the many that will be reorganizing a series of supervisors' conferences with the object of sharpening up the operations. Whether you take part in a highly-organized discussion group meeting on a definite schedule or in the less formal "Saturday morning" staff meetings at the mine, there are certain returns you will want from the meetings.

First and foremost, you will want to get ideas from the group. But all conferees are attending the meeting for the same reason, and none will get any ideas if each sits and waits for his cup to be filled. Before anyone can "get," somebody must "give."

What follows, therefore, is a collection of thoughts on how you can contribute something of value to such conferences and how to search for good ideas that you can bring away with you.

But permit us to get one thing straight. There are no new and startling developments in the art of attending conferences. These are conclusions at which you would arrive, if you were to sit down and think about the matter. So we invite you to bide and think with us.

To begin, perhaps we should define the limits of our discussion by setting up a number of points to be considered. Such a course of action will give us targets to aim for. We'll not be firing at the moon with a shotgun when we should be using a rifle.

Let's explore three points, as follows:

1. How constructive personal attitudes among conferees increase the value of the sessions.

2. How valuable opinions and suggestions can best be formulated and contributed for the benefit of the group.

3. How worthwhile ideas for on-the-job application can be distilled from the discussion.

1. CONSTRUCTIVE ATTITUDES

If the meetings are to be successful, as far as you are concerned, you must approach them with certain attitudes that will make you receptive rather than repellent. Here are four suggestions to help you create this proper mental atmosphere.

1. Recognize the need for supervisors' conferences. These programs cost money, from which your company naturally hopes to realize some benefits. Where training conferences for mine bosses already have been used, results have been gratifying. Communication between management levels has been improved, waste has been reduced, safety has increased and experience has been shared. In the process, all supervisors are better fitted to support their company in achieving its aims with least lost motion.

2. Generate an interest in the proceedings. In any conference, where a number of viewpoints backed up by varied experiences are offered, you can be sure that most of the discussion will be of direct interest to you, but only if you generate the interest within yourself. Don't embrace the idea that you are coming to be entertained. Here's the key: Promise yourself that you will devote your undivided attention to the conference proceedings during the first three sessions. After that, you will have the habit of sticking to the business at hand. Your interest will lag only if you let your mind wander.

3. Recognize the leader's function. The conference leader is not a teacher in the accepted sense of the word. His function is to channel the stream of discussion to some profitable or rewarding end. In so doing, he leads the group to conclusions which make the conference more than a mere "bull session." While he may offer suggestions and comments, the major share of the burden of providing discussion material lies on the conferees.

4. Come with an open mind. Men with inflexible minds, hidebound by tradition, cannot contribute much and probably won't benefit at all. Holding strong opinions is a manly attribute, but be prepared to re-examine them if the other fellow's facts contradict your opinions. Promise yourself you won't be stubborn in the face of facts more pertinent than your own.

Having formed these attitudes, you will attend the conferences with an urge to contribute and an eagerness to learn.

2. HOW TO CONTRIBUTE

As mentioned, if you want to take ideas from the group, you will have to pay off with some of your own. Here are some suggestions to guide you in speaking your mind.

1. Listen to what is being said. Whether the conference leader or some member of the group has the floor, pay strict attention. You will be able to stick to the subject and any remarks you may care to make will be directed toward the heart of the discussion. Unrelated guff is a waste of time for everybody.

2. Never feel compelled to say something merely because everyone else has chimed in, and never speak for the sake of hearing your own voice. What comes out will be lightweight, and at times like these "Silence is golden." On the other hand:

3. Don't refrain from speaking up when you feel that you have something that will be of value. As to what is of value, you be the judge. Remember, the conference will bog down if you are reticent in offering your thoughts. Then nobody profits.

4. Think about the conference topics between meetings of the group. It takes an exceptional fellow to enter a conference cold and come up with startling new ideas. Few of us can pull rabbits out of hats. However, if you are interested in what is going on, and if you apply outside thought to the subjects under discussion, you will discover

READY NOW!



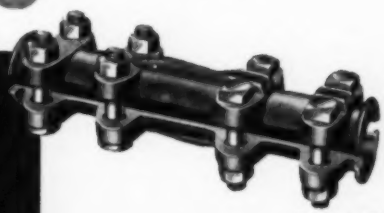
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worthwhile contributions germinating in your mind. If all group members apply these measures, the sessions will hardly be long enough.

5. Study your assignments, if the conference leader decides that assignments are desirable. Go out of your way to study allied material, thus getting a broader grasp of the subject. Assignments are not meant to harass you, but to make the meetings more productive for you.

We shall consider it unnecessary to mention that ridicule and scoffery have no place at a serious conference. An apparently ridiculous idea may prove to be quite sound; then the early scoffer becomes uncomfortable, to put it charitably.

3. HOW TO BENEFIT

We have arrived at the point of trying to nail down practical ways for lifting and carrying away some of the benefits that will spring from the conference sessions. At the outset, let's recognize the fact that you will find answers to your problems only if you recognize the problems. But who is in a better position than you to recognize your problems? You live with them every day. Having your problems in mind, here are some tips that will help you find the answers in conference with others in the same position.

1. Take notes during the discussion. In looking over these notes later, you may find the foundation for the answer to your problem. In fact, the discussion may have involved another subject, but some of the remarks may be applicable to your situation. Furthermore, in the heat of the discussion an obvious point may have gone over your head; you'll pick it up in reading the notes.

2. State your problem to the group. Someone else may have figured out a solution and it's yours if you'll do the asking.

3. Use the lessons you learn. The sessions will be of no benefit whatever if you cannot apply to your job some of the improvements you have learned. The lessons may apply to machines, methods or getting along with men.

4. Support the ideas of others. In looking with favor upon the ideas of others, you arrive sooner at the major roadblocks that might limit the realization of these ideas. Then be critical to make sure they can stand under scrutiny. If they pass muster, use them.

The success of the conference sessions depends entirely upon the co-operation you and the other men summon. The value of the series of sessions will depend upon the number of good ideas that find their way from the conference table into the mine.

Robinson Crusoe Knew Better

By HARRY C. WALTER, Editor
The Lorain-Lorado Journal

MOST OF US remember the story of Robinson Crusoe—how he was wrecked, alone, on an island, and how he managed to live solely by his own efforts.

Perhaps we remember, too, that when Crusoe went back to the wrecked ship to get what supplies he could, he also found a sum of money. This he stowed away as among the least valuable of the things he found on the ship. For what good was the money to him then, when there were no shops where he could buy things? What Crusoe needed was not gold, but knives and axes to make himself a shelter, muskets, powder, shot, clothing, bedding and food. These were the valuable things. Later he said he would gladly have given all the money—equal to several hundred dollars—for a handful of peas and beans to plant in his garden.

As he was unable to use the money to buy things, Crusoe started to produce food and clothing for his own use. Later, by the time he found his Man Friday, he was producing plenty of barley and rice, harvesting tobacco, breeding goats.

After Friday came, Crusoe had to increase his production of grains, because there were "two mouths to feed." Then Crusoe and Friday saved Friday's father and a white man from the cannibals, and still more food and clothing were needed. By working together, each at the task for which he was best fitted, they managed to supply themselves with the things they needed on the island.

The Crusoe story highlights the fact that it is production and goods that are the real need, not money. Money has value only if there are goods which can be purchased. If it were to rain money tomorrow, we would all be rich in terms of dollars. Yet unless we continued to work and to produce goods, what would such an abundance of money do except to raise prices fantastically high?

Actually, today in this country we have about three times as much money as we had in 1939, but we are producing only about twice as much goods. The inevitable result is that prices have gone up. There is more and more money to compete for the purchase of a given article—just as Crusoe was willing to give a high price for a few seeds—and the price of the article climbs. Sometimes there may be no relation between the value of an article and how much it will bring in money, as would certainly be the case if it rained money tomorrow.

We must remember what Robinson Crusoe knew so well. It is production, not money, which gives us our standard of living. The more we produce the more value our money will buy. Without increased production, an increase in wages will bring only a corresponding increase in prices. The real true standard should be what we can do with our money. And, whether on an island like Crusoe or in our complex society of today, the more we produce the higher will be our standard of living.

Reprinted from the *Lorain-Lorado Journal.*

★ ★ ★ ★ ★

Missing Success

A noted psychologist was asked recently to give the reasons why so many people failed in their efforts to make life successful. The great mind scientist penned 10 frank and valid reasons. Try them and see if they fit into your life:

1. Finding fault with the other fellow but never seeing your own.

2. Doing as little as possible, and trying to get as much as possible for it.

3. Spending much time showing up the other fellow's weak points, and too little time correcting our own.

4. Slandering those we do not like.

5. Procrastination—putting off until tomorrow something we should have done day before yesterday.

6. Deceit—talking friendly to the other fellow's face and stabbing him in the back as soon as he turns around.

7. False belief that we are smart enough to reap a harvest of pay before sowing a crop of honest service.

8. Disloyalty to those who have trusted us.

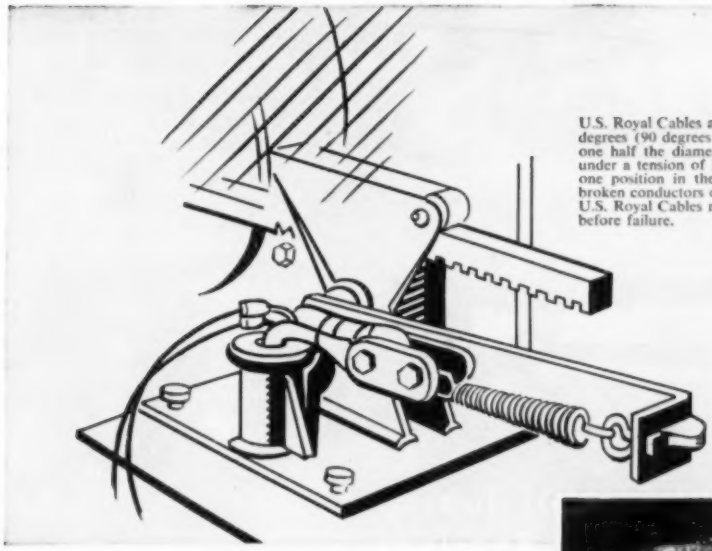
9. Egotism—the belief that we know it all and no one can tell us anything.

10. Last but not least, lack of necessary training and education to enable us to stand at the head in our line of work.

—The Morton Messenger

★ ★ ★ ★ ★

What other portable cables can pass this test?



U.S. Royal Cables are bent back and forth through 180 degrees (90 degrees in each direction) over a radius of one half the diameter of the cable while the cable is under a tension of 50 pounds. Bending is continued at one position in the cable until failure, due either to broken conductors or shorts between conductors. Many U.S. Royal Cables must withstand 3,000 bending cycles before failure.

U. S. Royal Trailing Cables are built for endurance

This is just one of half a dozen gruelling tests U.S. Royal Portable Cables must undergo. That's to make absolutely sure they have the full dependability required in today's mining operations. "U.S." builds these cables with the proper insulation and the tough jacket that are needed for long endurance.

United States Rubber Company is the only wire and cable producer to grow its own natural rubber, to make its own synthetic rubber and to manufacture its own plastics. "U.S." has been a pioneer in insulation for over 60 years, is backed by matchless experience and research data. Write to address below for free booklet, "U.S. Electrical Wires and Cables", which shows the complete line for the mining industry.





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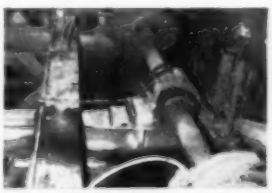
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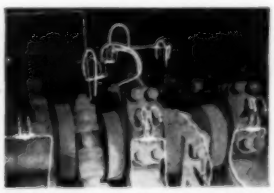
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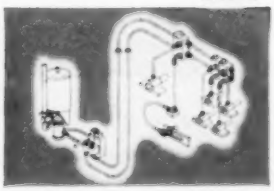
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Despite accumulated grit and grime, this 6" shaft assembly with six cams and 3 pedestal bearings operates at 160 R.P.M., 16 hours a day, thanks to Alemite.



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Rear-Dump Euclids of 10 to 34-ton payload capacity have a wide range of body designs . . . they're unmatched for efficiency on the haul road and dump . . . with travel speeds up to 35.7 m.p.h. . . . powered by diesel engines of 125 to 400 h.p.

Combining rugged construction, large capacity and fast loaded travel speeds, Rear-Dump "Eucs" and Euclid Bottom-Dump Coal Haulers provide high production and low cost hauling in open pit mines. Designed to work with large loading equipment, "Eucs" are built for heavy duty off-the-highway service.



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SANTA CLAUS

Could Die of Old Age

No one shoots Santa Claus. This remark about a government which spends and spends and spends may well be true. But it is also true that Santa Claus is an old man. At his age overwork might well kill him.

It is with the possibility of working Santa Claus to death that this editorial is concerned. No position is taken as between the contending political parties in the present campaign. Our concern is with the problem of protecting Santa Claus.

It is true that as a nation we now enjoy great prosperity. The prosperity is not nearly so general as the political advertisements of it would suggest. Millions of individuals, notably those living on pensions, annuities and other fixed incomes, have been robbed of half their purchasing power by inflation during recent years, and whole industries know little or nothing of boom times.

However, measured by so basic a gauge as unemployment, we do have great prosperity. Less than two million of our total working force of over 64 million are unemployed, and many of them are unemployed only while moving from one job to another. The real income, i.e., what their dollars will buy, of those with jobs is somewhere near its all-time peak.

Our Prosperity is Precarious

The prosperity we enjoy, however, is precarious. This is primarily because it is dependent upon a rising volume of expenditures by the federal government. At present almost a quarter of our entire national income is ladled out through Washington, and in an ever increasing amount.

If, as matters now stand, federal expenditures were to be suddenly and sharply cut, our government-financed prosperity would be severely upset. But if the federal government were to try to keep right on providing prosperity by steadily increasing its expenditures, the end result would be more certainly disastrous. It would be a crash caused primarily by having continuing inflation of prices destroy the value of the dollar.

Higher government expenditures of worthless dollars then could accomplish nothing. Santa Claus would be dead from overwork.

To Provide Firm Foundations

The general route to be followed in putting firm foundations under our prosperity is quite clear. It involves two steps which must be taken closely together. The first is to stop the continuous increase in federal expenditures. The second step is to substitute expanding private business for government-financed business as the principal foundation of expanding prosperity.

The increase in federal expenditures can be stopped without sacrificing any effective measures now directed toward meeting our top priority requirement—protection from armed Communist aggression. The most competent authorities of both major parties agree it can be done by (1) better planning of and the elimination of outright waste in defense arrangements, and (2) cutting those civilian expenditures which cannot be justified at the same time we are undertaking a great new load of defense expenditure.

It is also possible to substitute expanding private business for government-financed business. The problem is primarily that of relieving private business of the staggering load of federal taxation it now is carrying. Federal taxation now takes 52 per cent of all corporate profits and 82 per cent of all so-called excess profits. If it were not for the forced draft placed under our economy by rapidly mounting defense expenditures, this burden would surely lay a disastrous blight on private business expansion. If expanding private business is to have a chance to play its critical role as a substitute for government-financed business, its taxes must be cut, and soon.

It Won't be Easy

It would be naive to contend that it will be easy to check the expansion of federal expenditures. They have been running wild too long, and in the process contributing to a feverish, inflationary prosperity. Likewise, there is no reason to believe that the easing of the load of business taxes is going to be easy. The basic blight it puts on business expansion has been too long obscured by having our economy dosed with artificial stimulants, most notably enormous injections of federal expenditures.

The Key Question—How Long?

It is obvious that prosperity is going to be a major topic of discussion in the present political campaign. There is nothing the matter with that. Prosperity is a key concern of the voters in choosing a national administration.

To make the discussion of prosperity really useful, however, it is important to ask and get answers to the right questions about it. The key question is not whether or not we have prosperity. That we have it in large measure is generally conceded.

The key question is, "How long can we continue to have prosperity?" The answer—not very long if we continue to rely primarily on new injections of inflationary federal expenditures. Santa Claus, be it remembered, is no youngster. If we continue our present improvident course, he will be worked to death. Those politicians, regardless of party, who see this clear danger and who have plans to escape it are facing up to the crucial question about our prosperity.

McGraw-Hill Publishing Company, Inc.

Operating Ideas



Cables and Overhead Drum Control Truck Dump

BRAKES FOR GRAVITY DUMPS for flat-bed swing-endgate trucks can be of several styles, including the well known sword slung underneath the platform and braked by clamping between friction shoes. A braking device with the mechanism all above the platform is used on the dump at Esco No. 10 mine of the Utilities Elkhorn Coal Co., Esco, Pike County, Ky.

On this dump, a wire rope fastened to the front end of the platform goes up to a 6-in pipe, makes 3 turns around it and goes down to a fastening at the rear end of the platform. The pipe is in bearings, and therefore acts as a drum which rotates when the dump tips. On one end of the pipe or drum is a brake wheel with brake bands and a long lever for control by the dump operator. The 6-in pipe extends across the dump to accommodate a wire rope on the other side.

With the pipe mounted at minimum height to clear the trucks the ropes normally loosen slightly as the platform is tipped. To maintain a constant tension so there will be no slippage on the drum, a spring is inserted in each rope. It is a compression spring placed between two links. This arrangement shows in the foreground of the photograph.

FLAT-BED SWING-ENDGATE TRUCK tipped backward to dumping position. With his right hand the operator is holding the lever controlling the brake of the cable drum at top.

Treadle Controls Siren To Warn of Backing Cars

EMPTY TRIPS backing past a propeller-type fan and almost opposite the shop door at the Tams (W. Va.) mine of the Gulf Smokeless Coal Co. could not be heard above the noise of the fan. Therefore, a siren was installed to sound automatically. The electric switch is a treadle-type unit depressed by the wheel flanges. Treadle length equals the wheel base of the cars. The treadle is held up by heavy coil springs and the electrical circuit is completed by a contact finger from a mining-machine controller.

The siren is not extremely loud—only sufficient to be heard distinctly above the fan noise by anyone walking near the fan or near the shop door. If there is a haulage delay, causing a car to stand a long time on the treadle, the shop men can switch off the siren temporarily.

DON'T HOLD BACK on any "Operating Ideas" you've successfully put to work at your property. COAL AGE will gladly pay you a minimum of $10 for each usable item, on publication. Just tell us about your idea in your own words, enclose a photo or sketch if needed and we'll do the rest. Write: The Editor, COAL AGE, 330 West 42 St., New York 36, N. Y.



SIREN TREADLE in foreground on empty track, mine fan at the right and the shop in the background.

Kennametal Bits
Cut 10 times more places per bit life



at Vinton Coal and Coke Co.



POWER SAVED
Use of Kennametal Cutter Bits has reduced power consumption by as much as 30% to 50% in typical Penna. and W.Va. mines. The comparisons were made using either tong-testers or watt-hour meters.



BITS STAY SHARP LONGER
The Kennametal Bit illustrated is typical of a set that cut 100 places (Winifred Seam, W.Va.) before being sharpened. Bits were still capable of cutting several hundred more places.

The severe cutting conditions at Vinton Coal and Coke Co. had often made bit changing necessary after each place cut. Bits had to be discarded after cutting a maximum of only 10 places.

The company decided to change to Kennametal to increase their tonnage per shift. They have found that Kennametal U-1 Bits give them greater production, as expected, by cutting 100 places to the other bits' 10. Important *additional* savings in time, power output, and bit sharpening costs were also effected. *Overall savings,* mine executives estimate, *amount to 5¢ per ton.*

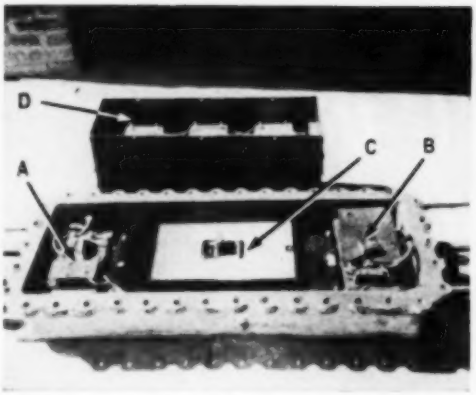
Kennametal Bits give outstanding service because of their practical, proven design, and because their tough, Kennametal tips have shock and wear-resistant qualities equalled by no other tungsten-carbide in the coal industry. Your Kennametal representative —a veteran mining man—will gladly go into your mine to demonstrate and prove how these Kennametal advantages can reduce *your* cutting or drilling costs. Get in touch with him today!

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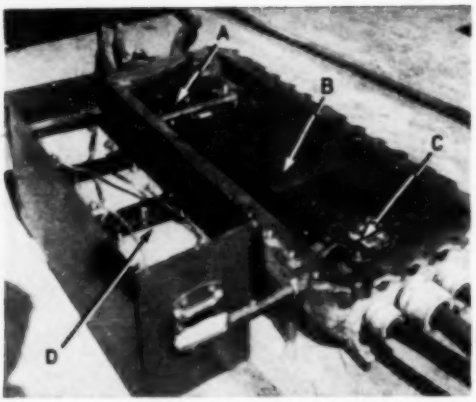


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TYPE D. B. ground-fault trip, installed in an explosionproof metal box consists of (A) overcurrent-fuse Type X trip, (B) D. B. ground-fault trip, (C) 600-amp circuit breaker and (D) three grounding transformers

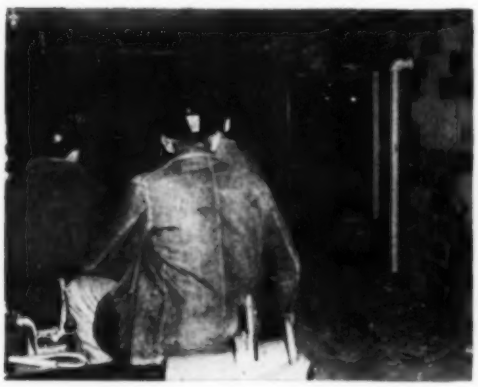


TYPE K. P. overcurrent protection unit, installed in an explosionproof metal box, consists of (A) D. B. ground-fault trip, (B) 600-amp circuit breaker, (C) K. P. overcurrent trip and (D) grounding transformers.

Mine Inspector Develops New Unit For Ground Fault and Overcurrent Protection

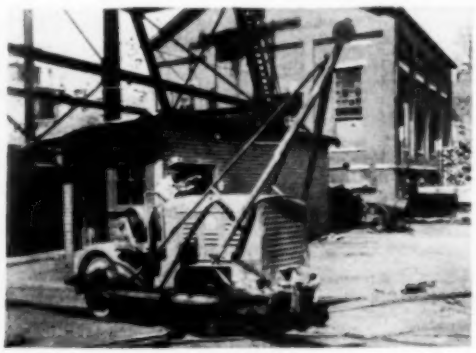
AN AUTOMATIC GROUND FAULT TRIP developed by Sam Wells, state mine inspector, Coalgate, Okla., offers great flexibility in ground fault and overcurrent protection. Complete automatic protection from any type of overcurrent or ground is made by use of fuses, signals, relays, contacts, timing and mechanical devices. For example, should a fuse burn from overcurrent the equipment is still protected from shock by being grounded to the ground station and a signal is given that the overcurrent fuse has burned. Another feature is an adjustable timing unit which permits time between grounding and operation of the trip to be adjusted according to the needs. When used for ground fault protection without the D. B. trip the fuse acts as an overcurrent and ground fault protection. The equipment functions instantaneously if a major fault occurs in the system being protected.

At present this equipment is in service at the Carbon mine of the Lone Star Steel Co. where it is being tested and observed. The equipment is not being manufactured, but after tests have been completed Mr. Wells hopes to have it available.



Good Trick With Mirrors

MIRRORS make it possible to see around curves and that principle is put to good use in promoting haulage safety at the Williams mine of the Consolidation Coal Co. (W. Va.), Div. Pittsburgh Consolidation Coal Co. Two mirrors, mounted on the outside rib of a long curve show the entire curve and the track beyond to motormen entering the curve from either direction. Men, rolling stock or accidental obstructions therefore can be seen in time to slow down or stop.



Mulga Handy-Andy

ONE OF THE HANDIEST PIECES of equipment around the place is the description given this pulling and lifting unit at Mulga mine of the Woodward Iron Co., Mulga, Ala. The basic element is a Buda-Hebard rubber-tired tractor, to which has been added a rope drum and mast with sheave. Thus, the unit can be used for pulling, towing and lifting, including handling supplies, machines and machine parts, and for pulling and towing mine cars, skids, railroad cars and so on. It is in service practically continuously when the mine is operating.



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TELESCOPIC FEED—LONG STEEL CHANGES—LIGHTWEIGHT LOW AIR CONSUMPTION



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You can cut your roof-bolting costs away down with Joy Stopers . . . with constant-pressure telescopic feed and centralized control.

In the first place, the long steel changes that Joy Drills afford mean *fewer* steel changes for your roof-bolters and more time spent in actually drilling . . . *more hole footage per shift.* What's more, fewer steel sizes need be carried in stock and hauled to the face.

In the second place, Joy Stopers have several exclusive features: such as *cadmium-plating* inside and out for rust-protection, closer tolerances and easier run-ins . . . and the famous *Dual Valve* that "makes air do more work". These features make for greater efficiency, longer service life and less maintenance.

Joy builds a complete line of roof-bolting equipment—air-operated or hydraulic. ● *Call on us for details . . Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa. In Canada: Joy Manufacturing Company (Canada) Limited, Galt, Ontario.*

SPECIFICATIONS

	SAL-37T			SAE-9IT			
Steel Changes	30"	36"	42"	30"	36"	42"	48"
Weight	63#	65#	67#	98#	103#	106#	109#
Collapsed Length	25"	28"	31"	23¼"	29⅝"	32⅝"	35⅝"
Extended Length	61"	70"	79"	57½"	73⅛"	82⅛"	91⅛"



WBD CL-4301



Tap Stations Clear Trolley Wire

TO KEEP THE TROLLEY WIRE CLEAR for haulage traffic, tap stations for cable-operated equipment are installed alongside the wire at the Williams mine, Consolidation Coal Co. (W. Va.), Div. Pittsburgh Consolidation Coal Co. How a station looks after it is up is shown in the accompanying illustration. The short length of wire to which the taps are made is held by two Ohio Brass Bulldog trolley clamps followed by Dirigo spools and insulated I-beam hangers. Two O-B feeder clamps and a length of cable join the station to the trolley wire.

Here's One Way to Reduce Underground Fire Hazards

ON MAIN HAULAGE ROADS where steel beams are used as roof supports, trolley and feeder-line hangers should be attached to those beams for maximum protection from fire, writes George T. Fisher, Ronco, Pa. With that arrangement, the beams will not block from view the sparking and arcing of a grounded hanger.

If trolley and feeder hangers are anchored in lagging over the beams or into the roof coal itself, the maximum protection possible is not obtained, Mr. Fisher points out, since a grounded hanger is usually detected by arcing or sparking after the lagging or roof coal is well on its way to a mine fire.

Even when spool-type insulators are used, the hangers should be attached to the steel beams, because if there is moisture in the air, a faulty insulator will crack and later swell, finally becoming grounded. Since excessive moisture is prevalent in the mine atmosphere during the warmer months of the year, especially when the humidity is high during a prolonged period, that is the time to particularly guard against grounded hangers.

Experimental Strip Mines Show How to Stop Stream Pollution

MINE-ACID POLLUTION of streams in Pennsylvania caused by strip mines is being controlled experimentally, reports Dr. S. A. Braley of the Mellon Institute, Pittsburgh, senior fellow on the Fellowship on Mine Acid Drainage established at Mellon Institute in 1946 by the Pennsylvania Sanitary Water Board and now supported jointly by the state and the coal industry.

For a good part of the past 6 yr the fellowship has been working on problems of acid drainage from strip mines and has established a few principles of operation by which an operator can, in most strippings of the sort found in this district, control acid drainage and, in fact, acid formation. The Sanitary Water Board has issued a number of special permits for experimental strippings on a commercial scale, based upon these principles.

The sulfuric acid found in drainage from many mining operations results from the action of air on sulfur-containing compounds that occur in and over coal beds. It may be found whenever coal measures are exposed to air, even when a highway or railroad cutting slices through a coal seam. The acid formation isn't complete without water and, of course, unless water carries it into a stream there is no pollution problem. It is impossible to keep all water out of a strip mine, but it may be controlled so that no acid is carried out of the pit.

THREE KEY RULES

Each stripping presents its own geologic problem, but under typical conditions stripping can be done without stream contamination by following these simple rules:

FIRST—Keep surface water from the surrounding area out of the pit, usually by a simple ditch circling the mine on the up-hill side. Spring water or seepage within the stripping can be ditched or piped directly outside.

SECOND—Sulfur-bearing shale, rock and low-grade coal uncovered in stripping must be separated and kept out of the way of flowing water. The floor of the mine must be kept clean, so that machinery won't crush and spread the sulfur-bearing materials around where rain can soak out the acid.

THIRD—While the mine is being backfilled, the segregated sulfur-carrying materials should be bulldozed against the foot of the highwall, and covered with at least 8 ft of hard-packed clay. Sometimes the quantity of sulfur-bearing material is small enough that it can be spread out over the floor of the cut, packed down by rolling or by driving a tractor back and forth over it, and then covered with a layer of hard-packed clay before the cut is filled.

Then, with the backfill being made against the highwall, it is smoothly sloped so that rain and surface water will drain away fast without soaking in the ground or standing in pools. The fill should be built up against the highwall carefully, so that it will not slip down or away, leaving a crack into which run-off water can pour.

In some strippings, when the coal is quite deep, or below the water level of the surrounding country, backfilling may not be needed. The sulfur-bearing waste may be spread on the floor and covered with clay, after which the mine is permitted to fill with water, which will effectively seal off the air. Once the acid actually produced during mining is drained off, only clean water will flow from the mine because no air can get to the sulfuritic material to make more acid.

WIDE USE POSSIBLE

With few exceptions, Dr. Braley said, these principles can be followed in any of the Pennsylvania coal fields. A few cases had come up, he pointed out, where the thickness of some sulfur-bearing formations was so great that it would be impossible to fulfill every rule so far established. "But," said Dr. Braley, "operation of a dry pit is possible in any strip, and so most of the stream contamination by any stripper is preventable now. The amount of acid carried out of any coal mining operation is closely proportional to the volume of water flow—high in wet weather and low in dry weather. A working area where you don't get your feet wet won't pollute any stream."

The experimental strip mines have shown that any future legislation designed to protect streams must be flexible rather than detailed and rigid. The general principles will work everywhere, but each mine presents a slightly different problem which can't be exactly prescribed far in advance.

One operator, for example, was able to cut his backfilling expense in half by filling his strip in the shape of a shallow valley with a definite downward slope throughout its length, through which the water ran rapidly out of the area, with no time to soak in. Although cost of the more expensive method of backfilling would only have equaled the amount of the operator's bond, granting him official permission to use this more economical method actually achieved a more effective land restoration.

HAULAGE WAYS *Jr.*

How a Lump of Coal Traveled 20 Miles------- *Without Moving!*

● "Controlled Slack" in O-B Automatic Mine Car Couplers pays off in smoother trip movements, less spillage, and clean haulage ways at Vesta Mine No. 5 of the Jones and Laughlin Steel Corporation. Vesta No. 5 officials demonstrate their smooth haulage in a simple, surprising test. They set a lump of coal on the ledge of an empty car in an inbound trip, and ring it with a chalk line. When the car returns to the dump, the lump is still on the car ledge, within the ring. This performance is made more impressive by the fact that some of the working places are 10 miles from the dump. Thus the marked lump makes a round trip of 20 miles without being disturbed.

O-B Automatic Mine Car Couplers make this performance possible. Tough, resilient rubber draft gear provides controlled slack for each coupler installation. It absorbs the haulage jolts and jerks, allowing cars to start and stop without shaking the load.

Find out what "Controlled Slack" can give to your haulage operation. Write to Ohio Brass Company for complete information on O-B Automatic Mine Car Couplers for your cars!

Ohio Brass

MANSFIELD OHIO, U. S. A.

IN CANADA: CANADIAN OHIO BRASS CO., LTD., NIAGARA FALLS, ONT.



Marked lump of coal makes 20-mile round trip without being disturbed, because O-B Automatic Mine Car Couplers absorb haulage jolts and jerks, allowing cars to start and stop without shaking the load.



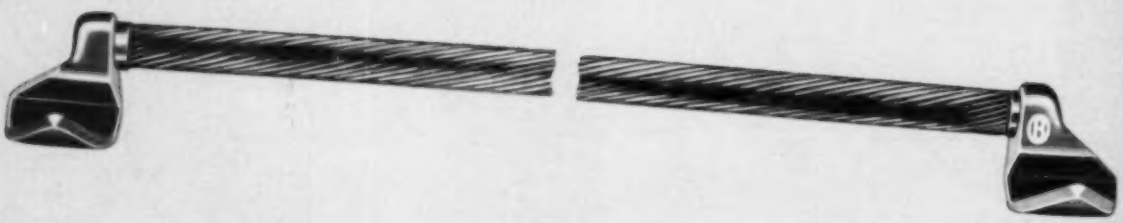
HAULAGE WAYS *Jr.*



New AW-22 Rail Bond

Quick, easy welding • Lower terminal resistance • Over or under base installation • Reclaimable

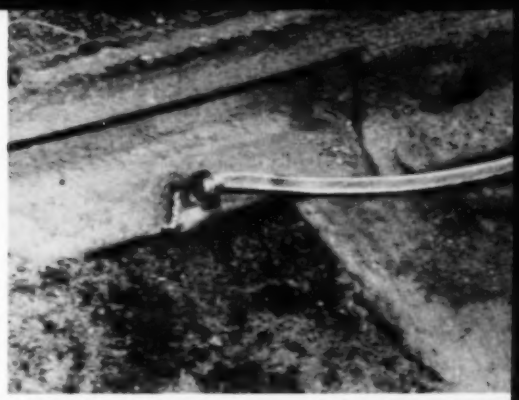
SEE HOW THESE BENEFITS WORK FOR YOU



WELDING EASE

Angular shape of the AW-22 Bond terminal makes open, accessible welding paths. There is no interference to welding rod movement from the rail head. This is true whether the strand is above or below the rail base.

Many welders find that only one head is necessary for a strong, permanent weld. Welding area is easily reached because of the wide angle between the rail surface and the edge of the terminal.



OVER OR UNDER BASE

Clip-shaped terminal holds rail securely before and during welding. Under-base installation gives terminal good protection from derailed wheels, dragging equipment, and the like. O-B Type AW-22 Rail Bonds are used for cross-bonding, too.



RECLAIMABLE

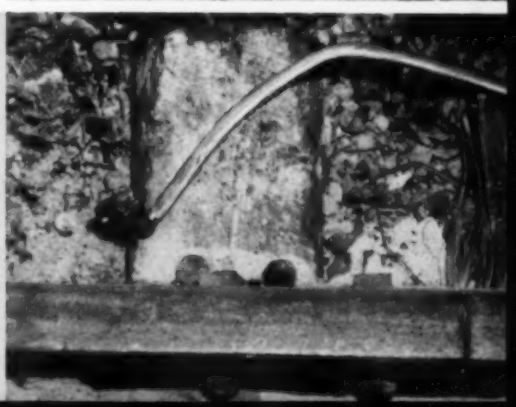
Reclaiming AW-22 bonds with hammer and chisel does not damage the terminal. The reclaimed terminal shown here needed no dressing or repair before being used again.



LOWER RESISTANCE

Angular shape of the terminal shortens the rail-to-copper electrical path, minimizing terminal resistance. Copper strand runs *through* the terminal; is welded to the terminal on its outer face. Thus the weld between strand and copper is *as close as possible* to the weld between the terminal and rail.

Talk to your O-B representative, or write to Ohio Brass Company, for complete AW-22 information. Ask for Publication 5767-M.

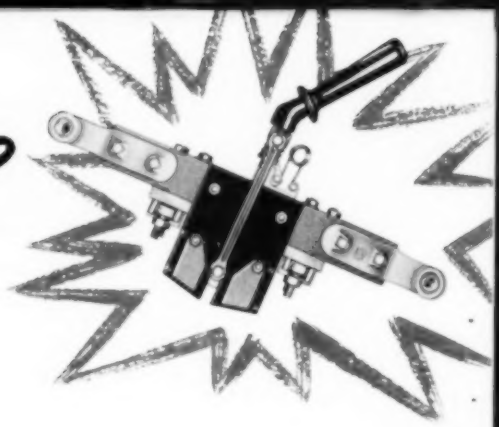


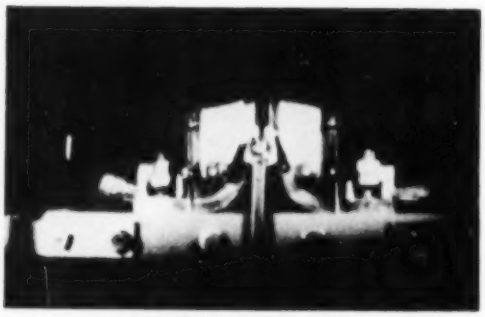
Ohio Brass

MANSFIELD OHIO, U. S. A.

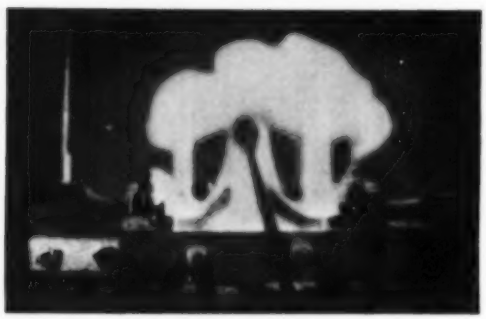
IN CANADA: CANADIAN OHIO BRASS CO., LTD., NIAGARA FALLS, ONT.

What goes on here?





Type-R Switch in closed position



Interrupting the Load

O-B Design Engineers recently put an O-B Type-R Roller Switch through its paces before the all-seeing eye of a high-speed movie camera. Just curious! They wanted to know exactly what happens to the switch roller and contact springs when the switch opens on high-voltage current.

As a result of their curiosity, the switch design was changed to give better-than-ever load-interrupting action. Out of a routine check came a way to improve an already excellent switch. It's another example of the continuous testing in O-B laboratories to make good products better.

All this is just another way of saying that every O-B product you buy is "The BEST we know how to make!"

Ohio Brass

MANSFIELD OHIO, U. S. A.

IN CANADA: CANADIAN OHIO BRASS CO., LTD., NIAGARA FALLS, ONT.

4303-M

HAULAGE WAYS *Jr.*

OHIO BRASS COMPANY
380 North Main Street
Mansfield, Ohio

Please send _____ copies of the September Roof-Bolting issue of O-B Haulage Ways to:

Name .....

Title .....

Company .....

Address .....

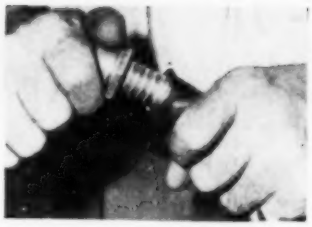
City ..... State .....

Did you see the Big September Roof Bolting Issue of O-B Haulage Ways?

It was a dandy – 20 full pages of up-to-the-minute information on roof bolting techniques and equipment. If you missed your copy, or would like additional issues, fill in the coupon at the left and send it to Ohio Brass Company.



USE CARE in installing couplings. Cut ends square with a sharp knife.



PICK THE RIGHT COUPLING for the job. Ram coupling in for a good fit.



INSPECT HOSE FREQUENTLY and remove weak spots to avoid breaks.



KEEP HOSE CLEAN, particularly of oil and grease unless it resists them.



STORE PROPERLY, whether in service or not. Old pail handles extra hose.

How To Get More Service From Industrial Hose

By J. A. MULLER, Executive Engineer, Thermoid Co., Trenton, N. J.

THE FIRST STEP in getting the most from your hose is to select the correct hose for the job. Many users give very little thought to selecting hose, buying mainly on price. It is not realized, for example, that there are many special types of hose for special applications in many industries.

The standard rubber hose consists of an inner tube, a carcass of fabric or cord and a cover. The composition of the rubber of the inner tube determines what material can be carried. The kind and the thickness (number of plies) of the carcass limits the pressures the hose can stand. The cover is designed to withstand the various working conditions encountered in industry.

Although not a component of hose, couplings are an important part of any hose system. Many types, made from several kinds of metals, are available for general and specific uses. In high-pressure applications, the couplings become the most critical factor.

HOSE SELECTION

For long, efficient, economical life, the following factors should be considered:

1. Material Carried—Will the hose chosen withstand attack from the material carried? If a petroleum product is to be carried, an oil-resistant hose should be specified. Paint and some insecticide sprays take a special hose. Steam requires a special hose.

2. Working Pressure—Stay within manufacturer's limits. Some hose will handle extra pressure for a while but it will fail more quickly and, more than likely, unexpectedly with damage to personnel and equipment and loss of production.

3. Temperature—Both that of the material being carried and ambient temperatures should be considered. Low and high temperatures must be compensated for by special rubber compounds and constructions.

4. Carrying Capacity—The inside diameter of a hose determines the carrying capacity. If the diameter is too small, you won't get the volume required. Too large a diameter means lower pressures.

5. Length—Specify enough length to avoid stretching. Excessive length increases the chance of kinking.

6. Couplings—The hose system is only as good as its couplings. Even the best hose can't operate with incorrect, improperly applied couplings.

7. Abrasion Resistance—Abrasion-resistant covers are a must for severe service conditions such as mines, quarries, heavy industrial manufacturing.

HOSE MAINTENANCE

Maintenance begins as soon as the roll or length of hose is received. If the hose is not being used immediately, store it inside out of direct sunlight in the manufacturer's original wrappings. Do not unwrap and leave the roll outside in direct sunlight. If the roll must be left outside, put it out of harm's way.

When the hose is to be used, unwrap and uncrate carefully. Don't slash at the bindings with a knife—you may cut gashes in the new hose. If delivered uncoupled, make sure the correct type and size of couplings are used. Check the length required before cutting. Use a sharp cutting tool and cut the hose square. Make sure the coupling is properly placed on hose—that it is inserted all the way in, that the securing clamps or other devices are tightened. If the volume of coupling is large, a hose shop should be set up with proper tools and suitable personnel trained. If your organization uses thousands of feet of hose regularly, the value of a hose installation and maintenance crew should be investigated. The function of this crew would be to inspect hose regularly for weak spots, cuts and worn spots and loose couplings, so that actual breaks would be avoided.

Keep the hose away from hot pipes, stoves and hot pieces of equipment. If contact with hot metal cannot be avoided, cover the hot spot with asbestos.

Although anti-oxidants are put into all modern hose covers, oxidation remains the principal enemy of rubber hose. Strong, direct sunlight speeds up oxidation and should be avoided. A particularly bad offender is ozone (O_3) which occurs to some extent at high altitudes and in harmful concentrations near high-voltage equipment.

Oil and grease on a hose are bad unless the hose is specifically designated as oil-resistant.

Harsh abrasion and punctures should, of course, be avoided. It is generally good practice to cut out a badly worn spot before an actual failure occurs and install a new coupling.

Take care to keep hose away from falling rocks. In quarries, mines, and construction jobs where falling material is a normal occurrence, hose should be removed to a safe area before blasting or protected by a guard. At road crossings, hose should be carried overhead on a scaffolding or underground by conduits.

When not in use, hose should be stored inside out of the sun, flat on the floor rolled in coils of large diameter to avoid kinking. The rolls should not be so large that the weight of the coils will crush and weaken the bottom layers.

For temporary storage, hose can be hung on wall brackets. Adequate support in more than one place is required to prevent sharp bends. Hooks or other supports should be thick enough so that the hose is not cut or subjected to excessive distortion at the point of contact.

Only

KENNAMETAL

offers you . . .

- **LONGER LASTING CARBIDE**
- **SUPERIOR BIT DESIGN AND CONSTRUCTION**
- **EFFICIENT FIELD SERVICE**



to Give You Better All-Around Bit Performance . . .

Kennametal Carbide, bit design, and field service are a proved combination of features, offered only by Kennametal, that assure lowest coal cutting cost, at highest efficiency.

Kennametal Carbide possesses greater uniformity of grain structure which gives it maximum resistance to impact and wear. Evidence of this fact is that 95 per cent of the cutting and drilling in hard potash ore deposits is done with Kennametal. This is as severe a test of the stamina of a bit as exists. The design and construction of the Kennametal Bit itself is no less important. The bit body is a special alloy steel that is heat-treated and hardened to the extent that it has the highest strength obtainable in a 1"x ½" steel section. A shoulder on the bit gives the cutting edge extra support, and prevents the bit from freezing in the block. In addition, Kennametal Bits are offered in more than 30 different types of cutting edge construction. This affords opportunity to have a design best suited to your needs—cost, job, equipment considered.

These outstanding features of Kennametal are supplemented by competent Kennametal field representatives, veteran coal mining men, who are always available for demonstration or for service on any trouble that may develop. They give you the best, and they know carbide bits — inside out. Kennametal Inc., Latrobe, Pa.

KENNAMETAL ®



Quality Carbide Of The Coal Industry

World's Largest Manufacturer of Tungsten-Carbide Mining Tools

Angular Slotted Bits Drill Longer in Hard Roof



An angular slotted recess in the cutting edge of Kennametal Roof Drill Bits is a new design feature that greatly increases bit life, particularly in hard roof. It also reduces bit "wander". Operators have reported as much as 30 per cent longer footage in laminated sandstone with bits of the new design.

●

"First Aid" to Ailing Drill

Whenever you have trouble with drilling or cutting, "just call your Kennametal representative." He's an expert on these matters—and must be. He devotes all his time to them, and is a veteran coal mining man to boot. When one operator in Central West Virginia had a few armatures burn out, he called Jason C. McGuire, our local representative. After giving conditions the once-over, it was obvious that the bits were not being properly reconditioned. They were losing gage, and not allowing sufficient clearance for the auger. The problem was solved in a short time by giving the bit grinding man the proper instructions for the particular drilling conditions that were being encountered down at the face. It was a small, but important matter. But frequently little changes can make an appreciable difference in operating cost. Always depend on your local Kennametal representative for matters like this. He's glad to be of service.

●

Hexagonal Shank Bits for Drilling Holes for 2-5/16" Diameter Tubes



Kennametal Hexagonal Shanks in sizes of 1⅞" and 1⅛" provide strong bit construction for drilling larger diameter blast holes. They also enable the bits to withstand heavier pressure when they are being used on large drills for drilling hard impurities.

●

Jack W. Begley is New Kennametal Representative

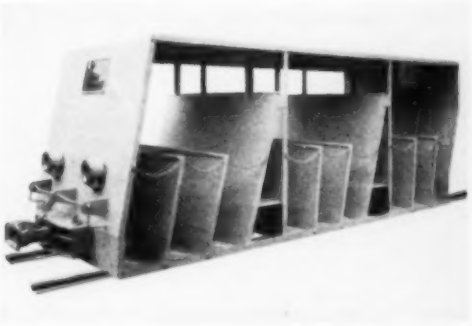


Jack W. Begley has been recently appointed Kennametal sales representative for southern West Virginia, western Virginia, and eastern Tennessee. Mr. Begley has worked in and around coal mines since the age of 16 and he takes over this assignment 1½ years after being graduated in mining engineering from the University of Kentucky.

(Advertisement)

Equipment News





Man-Trip Cars Operate on 60-Deg Incline (1)

Safety Control Car (left) and one of two man-trip cars (right) built by Sanford-Day for the Peabody Coal Co. were designed to operate on a 60-deg incline and 42-in track gage and are equipped with rubber-cushion-type wheels. The control car, which is approximately 18 ft long by 7 ft wide, is equipped with three pairs of GE shoe brakes and has seats for four maintenance men. The man-trip cars handle 36 to 45 men each and measure approximately 19 ft long, 7 ft wide and 6 ft 9 in high. Circle no. 1 on the postage-free card facing p 124 for data. Sanford-Day Iron Works, Knoxville 1, Tenn.



Shovel Scoop Speeds Loading (2)

Thew Scoop Shovel is an interchangeable 1¼-yd front-end attachment usable with any basic full-revolving TL-25 turntable. The machine can load on a level, down- or upgrade, with the dipper on the 8½-ft boom crowding in and out telescopically through a horizontal stroke of 6 to 7 ft. When standing in one place and swinging the load from face to trucks, the shovel can make three to four passes per minute, it is said. Full data from Thew Shovel Co., Lorain, Ohio.

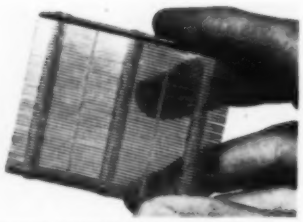


Hauls Large Units Within Legal Limits (3)

Utilizing the new Martin F4T-21 "Folding Gooseneck" trailer an unusual method of loading and hauling heavy 2-wheeled units such as the Caterpillar DW21 tractor and No. 21 scraper permits weight distribution within the 32,000-lb limitation of most states. While specially designed for the purpose, the trailer has a standard 8 x 14-ft platform that permits handling various other large equipment. Details from Caterpillar or Martin Machine Co., Kewanee, Ill.

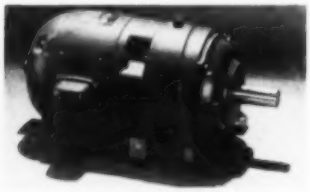
Take a quick run-through of the 72 new equipment items and catalogs described on this and the following editorial pages. They are briefed down and the main features highlighted to save you wear and tear in spotting what may interest you.

The postage-free card facing page 124 will bring more information or the catalogs offered in any item whose number you circle—without charge or obligation.



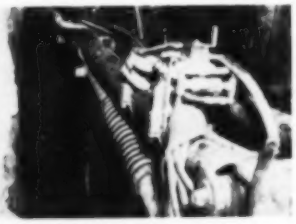
MORE DEWATERING AREA (4)

New Hendrick Wedge-Slot screen for fine materials is said by the maker to have at least double the open area of any other type of dewatering screen. It is made with stainless-steel bars, much smaller than ever used before, featuring a V-shape profile said to be most effective for various dewatering and drying operations. Mesh distortion is prevented by closer rivet placement and special spacing lugs. The screen is made in two types, with openings ranging from 0.004 to 0.06 in. Details from Hendrick Mfg. Co., Carbondale, Pa.



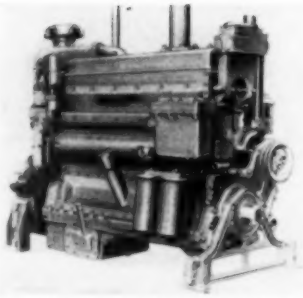
THREE-PIECE GEAR MOTOR (5)

Newly designed G-E gear motor is built in three pieces to permit easy, quick removal of defective stators without disturbing gear components or connections to load. It includes a compact planetary gear, mechanical adapter and G-E Tri-Clad motor. For standard applications of 1 to 75 hp and up to 200 hp for special uses, the units are said to minimize spare parts inventory and cut stator replacement time in half. Details from General Electric, Schenectady, 5, N. Y.



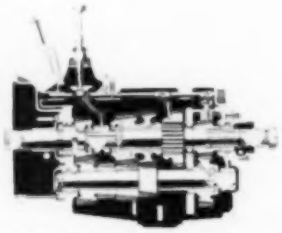
SLEEVES PROTECT DRILL (6)

Coal mining and rock drilling machines show appreciable savings on maintenance when equipped with Gortite telescopic accordion sleeves as shown above, the maker says. Fabricated to order, without old charge from neoprene-nylon, the sleeves can be engineered for numerous protective purposes for indoor and outdoor machines. Bulletin AH-2 from A & A Mfg. Co., Milwaukee 3, Wis.



HIGH-SPEED DIESEL ENGINE (7)

New Cat D326 high-speed diesel engine is a 6-cylinder unit with a 5¼-in bore and 6-in stroke. It is made as an industrial engine with an intermittent rating of 170-hp at 2,000 rpm; or as a 50-cycle electric set with a 12-hr rated output of 80 kw; offers Caterpillar fuel injection and other features. Full data from Caterpillar Tractor Co., Peoria 8, Ill.



TRUCK TRANSMISSION (8)

Fuller Model 4-FS-1440 transmission specifically designed for use with torque converters in the biggest off-highway trucks up to 400 hp, features closely spaced gear ratios and a high ratio of capacity to weight to permit new load-and-road performance. Advantages include smoother load pickup, smoother climbing, elimination of shock on engines, drives and axles and more operator ease. Data From Fuller Mfg. Co., Kalamazoo, Mich.



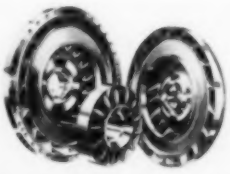
NEW-TYPE HARD HAT (9)

"Hard Boiled Cap" 70-902 BR made of Fiberglas features lighter weight, more air space and freer air circulation, a lower crown and unusual impact resistance, the maker says. The cap is made in one size with adjustable headband to fit all heads and has a grooved crown to hold the lamp wire in place. Information from Safety First Supply Co., Pittsburgh.



TRACTOR LOADER (10)

New Dearborn industrial loader is designed for fast handling of heavy loads, will lift 9 cu ft, or ½ ton, dumping at any height up to 10 ft 8 in. Mounted on a Ford tractor and hydraulically operated, the unit has its hydraulic pump on the tractor so that a dozer or other attachments may be put on the rear for "double-duty" operation along with bucket. Bulletin from Dearborn Motors Corp., Birmingham, Mich.



TORQUE CONVERTERS (11)

Expansion of Torcon line of hydraulic torque converters to include units in diameters of 11 to 26 in permits a wide range of use and selection based on application, work cycle and engine life as well as engine speed and horsepower. Available for gasoline or diesel engines of 30 to 80 hp up to those of 150 to 600 hp, Torcon units are automatic transmissions combining a hydraulic torque converter and hydraulic coupling to provide the advantages of both. Bulletin TC-649 from Torcon Corp., Ashtabula, Ohio.



SIGNAL LOW OIL LEVEL (12)

A further reduction of the human factor in automatic lubrication is possible with two new models of Oil-Mist lubricators featuring 1-gal oil reservoirs and built-in automatic warning switches that signal by

QUAKER *Production-eered** BELTING



MORE HAULS... FEWER OVERHAULS

QUAKER CONVEYOR BELTING

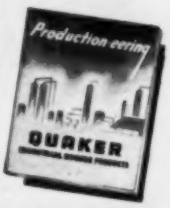
MOVES 1500 TONS OF COAL PER DAY... AT LOW COST PER TON

A ton per man per hour . . . some 1500 tons per day. Peak production . . . low cost per ton. That's the outstanding production record of this tough rubber conveyor belt "Production-eered" by Quaker for one of the most modern mechanized mines in the entire Southwest.

The Quaker Belt speeds up production by hauling coal from mine to tipple at the rate of 350 feet per minute. Model of efficiency, this 36-inch, 3700-foot Quaker "Production-eered" Conveyor Belt has moved millions of tons . . . and still shows no signs of wear.

Just one more example of Quaker "Production-eering" at work. Let a Quaker "Production-eer" — expert in the installation of industrial rubber products for greater efficiency — help you boost production and cut costs. Quaker hose, belting, packing, and molded rubber products are all "Production-eered" for more service with less servicing.

***Production-eering**—Every Quaker Industrial Rubber Product is "Production-eered"—engineered to provide maximum life, efficiency and production on each type of installation. Quaker "Production-eers" are ready to recommend the right rubber product for the right job. For timely production tips, get the new free booklet on Production-eering for Industry. Write today.



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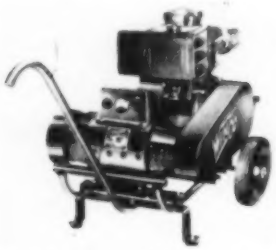


gripping strength, is said to permit electricians to safely pull fuses from the tightest clips without danger of slipping or twisting and also prevent fuses from slipping out of the jaws when being replaced in the panel box. The "Toggle Fuse Puller" weighs 2 oz and fits all fuses up to 100 amp. Star Fuse Co., Inc., New York 13.

(26) ALUMINUM BUS BARS now being used extensively in the Flex-A-Power feeder or plug-in electrical distribution systems manufactured by the Trumbull Electric Dept., General Electric Co., Plainville, Conn., offer various advantages over copper installations which weigh from 30% to 70% more. In addition to the easier handling, aluminum Flex-A-Power has an exceptionally high transmission efficiency and keeps voltage drop to a minimum, the maker says.



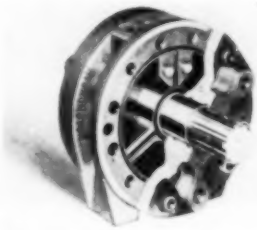
(27) ALL-PURPOSE PRESSURE from 0 to 12 tons for laboratory, home workshop or shop use is possible with Harco Press Model P-6612, said to be suitable for embossing, laminating, curing rubber, gluing under pressure, press-fitting parts, experimental plastic dies, duplicating die parts—"and as an apple press." Only 2½ in high, the unit has a 6 x 6-in movable platen with 8 in between strain rods and normal die space up to 8 in on standard model. Pressure cycles are accurately measured and calibrated in 15-sec units up to 15 min. Harco Industries, Inc., Rochester 5, N. Y.



(28) PORTABLE ENGINE-GENERATOR is designed for full output of 115 v, 60 cycles, AC, with capacity sufficient to start and run tool motors up to 1½ hp, lights, etc. The Model 4500 is available with either the standard tubular cradle base or "Speedy-Shift" rubber-tired attachment shown, and either with or without Briggs & Stratton No. 23 or Wisconsin No. AEN 4-cycle engine. Wincharger Corp., Sioux City 2, Iowa.

72 NEW PRODUCTS . . .

OR CATALOGS are described in this Equipment News section. The handy postage-free card at the bottom of the opposite page will bring you more dope on any of them—without obligation. Just circle the numbers of the items that interest you, tear out card and mail. This card is a Reader Service we'll be glad to have you take advantage of.



(29) TORQUE ACTUATORS—A reciprocating rotary actuator employing air, oil or other fluid medium, the "Hydromotor" provides equal power in either direction and can be readily controlled as to speed or arc of travel with an efficiency easily comparable to other types of hydraulic systems for similar duties, the maker says. Application data, as well as a program covering the wide range of standard and special models are discussed in Bulletin 21 issued by The Hydromotor Div., Bonnot Co., Canton 2, Ohio, which recently acquired Hydromotor, Inc., of Orrville, Ohio.

(30) VOLTAGE TESTER with only one test lead and other new design features announced by Holub Industries, Inc., Sycamore, Ill., is called the "Hi-Test" and indicates AC or DC from 115 to 600 v. The second test prod is permanently mounted in one end of the tester making it easy to hold the tester in one hand and the drum-type scale is covered and protected with a magnifying lens. Bulletin VT-852 gives prices and details.

(31) RADIO SYSTEM—Simple, compact microwave radio system operating over a frequency range of 940 to 960 mc, said to provide low-cost multiple channels for voice communication, telemetering, and remote supervisory and control functions, may be used over distances up to 300 mi, using a chain of repeater stations spaced at intervals of approximately 25 mi. The Type RCA CW-5B unit is designed for unattended operation, and the microwave transmitter and receiver may be installed in a single 84-in cabinet or open rack for terminal installations. Full details from RCA Victor, Camden, N. J.

(32) ENGINEERING CALCULATIONS, charts and nomographs of a high degree of complexity and the treatment of related mathematical problems in the field of mining engineering are part of the services of the newly formed Mathematical Computing Service, 105 Court St., Brooklyn 2, N. Y. A function of the group is the mathematical formulation and complete solution of a problem from given physical data.

(33) PLASTIC SAFETY GOGGLE called Saf-I-Flex features a newly designed frame of pliable Vinyl with rolled edges where it contacts the face and new type-grid ventilation which is said to make the goggle unusually comfortable and entirely fog free, with full side vision. Weighing 1.7 oz, the goggle reportedly offers full protection from all impact hazards and will fit over the widest-type personal glasses. United States Safety Service Co., Kansas City 6, Mo.

(34) UNIT HEATER—New 168,000-Btu Model VO-168 unit with an adjustable vent for permanent installation or portable on-the-job use operates on the Fageol counterflow principle of spraying heated air out across floor areas to form a 6-ft-high blanket of warmth in the work zone. Model VO-168 operates from a detached fuel supply, burning No. 1 or No. 2 fuel oil, kerosene or diesel oil. Bulletin L-5391 from Fageol Heat Machine Co., Detroit 11, Mich.

(35) SWITCHES—New line of PMK horizontal center-break switches incorporate a new contact assembly featuring independently sprung pressure-applying springs; a new bronze ball-bearing swivel terminal; and insulator bearings with non-rusting, double-race, stainless-steel ball bearings. Two types are available in all standard ratings from 7.5 to 161 Kv and in ratings of 400 (up to 46 Kv), 600 and 1,200 amp for upright and inverted mounting. Bulletin 5205 from Delta-Star Electric Co., Div. H. K. Porter Co., Inc., Chicago.

(36) GOGGLES—New Model 440 Eye-Savers features an extra-wide lens, improved nosebridge design, and a soft plastic frame that combine to make the goggles feel light and comfortable even after hours of wear while large enough to fit over the largest glasses, the maker says. The lens offers high impact resistance and optical clarity. Data and price list from Watchemoket Optical Co., Inc., Providence 3, R. I.

(37) ALL-PLASTIC WELDING HELMET features a shell made from a thermo-setting Fiberglas, reinforced Polyester resin by compression molding. It is said by the maker to be exceptionally strong and moisture resistant, will not warp, is lighter than vulcanized fiber and is easily cleaned and sterilized. Details on four models available from Boyer-Campbell Co., Detroit 2, Mich.

LATEST BULLETINS AVAILABLE VIA FREE CARD BELOW

(38) PREPARATION MEN will find the 122-p Hendrick 75th Anniversary Catalog of considerable value in the specification and use of perforated metals, screen and fabricated metals of all kinds. Various types are illustrated, with detailed tables of sizes and specifications and other information of help in proper application and ordering. Included also are 18 p of engineering tables. Available from the Hendrick Mfg Co., Carbondale, Pa.

(39) CURRENT . ROOF - BOLTING PRACTICE is covered in a 20-p special bolting issue of the *O-B Haulage Ways* available from the Ohio Brass Co., Mansfield, Ohio. In addition to describing roof-bolting at two particular mines, this useful booklet illustrates and explains installation of O-B expansion shells and plugs, and accessories, tells how to use hole gages and make holding-strength tests and provides other helpful data.

(40) LOW-COAL BELT CONVEYOR—Catalog CC-522 offered by the Goodman Mfg Co., Chicago 9, offers detailed construction and application data on the recently announced Type 98 Series belt conveyor specially designed for shuttle-car gathering in low coal. The units are available in 30- and 36-in belt widths and feature intermediate sections that knock down into pieces easily handled by one man in restricted working places.

(41) "HEAVY BULK MATERIAL HANDLING," a new industrial film recently completed by Heyl & Patterson, Inc., Pittsburgh 22, is now available for showings to industrial and engineering groups at no charge other than postage. It tells the story of the handling and transportation of coal and iron from mine to blast furnace and features prominent Heyl & Patterson heavy bulk-materials-handling equipment in action.

(42) BELTING BULLETIN available from Barber-Greene Co., Aurora, Ill., covers its conveyor belts ranging from light-materials handling to heavy-duty service under the most severe conditions. It shows how B-G construction is designed to defeat the major causes of belt failure and includes belt-selection tables simplifying a once complicated process. Parts and accessories also are included.

(43) SAFETY EQUIPMENT of various types and manufacturers is presented in a 144-p catalog titled "Everything For Safety" offered by Boyer-Campbell Co., Detroit 2, Mich. It describes face shields, welding helmets, "Supersight," "Skin-Cote" liquids and creams, goggles, safety clothing, machine guards, and many other products for a comprehensive safety program.

(44) SCRAPER—Bulletin 50, covering the 15.5-cu yd Euclid scraper released by the Euclid Road Machinery Co., Cleveland 17, describes and illustrates major design features and provides detailed specification data. The 15.5 cu yd Euclid scraper hauls loads up to 21 yd heaped at a 1:1 slope. It has a 275-hp engine, 10-speed transmission, 24:00 x 25 tires, and independently actuated hydraulic controls. Top speed loaded is 28.2 mph.

(45) SELENIUM RECTIFIERS—Operation and application of various types of Celab selenium rectifiers for mining manufactured by the Clark Electronic Laboratories, Palm Springs, Calif., are covered in Bulletin 124 available from the exclusive sales agent, Joy Mfg Co., Pittsburgh 22.

(46) SHAFT-MOUNTED SPEED REDUCERS—Engineering Bulletin A-614-A offers in compact style full engineering information and selection data on the complete line of Dodge Torque-Arm Speed Reducers and the new Dodge Overload Release designed for use with the reducer. Installation data and a new and quicker method of selection are included for the units, which have capacities up to 43 hp and speeds of 12 to 330 rpm. Available from Dodge Mfg. Corp., Mishawaka, Ind.

(47) SHEET-RUBBER COATING—Bulletin L-101 available from the Linatex Corp. of America, Rockville, Conn., describes the application and abrasion- and corrosion-resistance properties of Linatex, a special form of natural rubber made in Malaya and produced under a patented process in sheet form at 1/32 to ½ in thick in standard-size sheets 4x50 ft. Especially applicable to protection of machinery and repairs of rapidly wearing surfaces, Linatex is said to be completely resistant to moisture, offers greater resistance to abrasion, corrosion and vibration and can be attached or joined by a simple cold-air-cured type of cement to most surfaces, including metal, wood, concrete, etc., without specially trained men.

(48) DUST CONTROL—Bulletin 102 describing in detail the new Sly Dynaclone dust filter designed primarily for continuous-process industries where uniform suction at all dust points is essential gives complete engineering data on this equipment, including details of construction, principle and application. Included are hints on the engineering of dust control problems. Available from the W. W. Sly Mfg Co., Cleveland 2, Ohio.

(49) CONVEYOR-BELT LACING—Bulletin A-70 covering Alligator Long Length conveyor-belt lacing contains application views, sizes and list prices on these separable fasteners furnished in any length, with hinge pins, for joining flat conveyor belts of all widths up to 96 in and thicknesses up to ⅝ in. Available from Flexible Steel Lacing Co., Chicago 44.

(50) BRATTICE CLOTH—New circular describes Dandux brattice cloth in two weights and various widths. Offered by C. R. Daniels, Inc., Daniels, Md.

(51) SCREEN HEATER—Bulletin on the new Hanco electric-screen heater describes the features and application of the new "Quick-Change Attachment," which is said to make screen-cloth changes as simple and easy as they are on unheated screens, with faster screening and longer screen life resulting. Available from F. R. Hannon & Sons, Canton 7, Ohio.

(52) TRACTOR SHOVEL—Bulletin from Drott Mfg. Corp., Milwaukee 8, Wis., offers operating and construction details on three models of the new Drott Skid-Shovel for International tractors: 1¼ yd for TD-9, 2 yd for TD-14A and 3 yd for TD-18A. Specific applications, previously tough for tractor equipment, are suggested and complete specifications are included.

(53) "OUR LATCHSTRING IS OUT" is the title of a 36-p pocket-size booklet issued by Ingersoll-Rand that presents a brief history of the company, its plants and products and gives little known facts about the company. There are nearly 100 pictures showing its products at work, such as rock drills, air and electric tools and hoists, air and gas compressors, gas and diesel engines, centrifugal blowers, centrifugal and propeller pumps, vacuum and condensing equipment and refrigerating units. Form 300 is available from Ingersoll-Rand, New York 4.

(54) HYDRAULIC COUPLING—New Twin Disc disconnecting hydraulic coupling said to combine shock-absorbing advantages of a fluid drive with discon-

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Please send me catalogs or further information about the items from the Equipment News Section whose numbers are circled. (October, 1952)

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3	8	13	18	23	28	33	38	43	48	53	58	63	68	
4	9	14	19	24	29	34	39	44	49	54	59	64	69	
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In addition, please send me data on these OTHER products advertised in this issue (give name and page number) .....

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necting features of a master clutch is described in Bulletin 500. Included are features and diagrams of the Model HUD; and a horsepower-range chart covering the two sizes: coupling size 21-in diameter, ranging from 35 to 450 hp, and size 27-in, ranging from 65 to over 600 hp. Available from Twin Disc Clutch Co., Hydraulic Div., Rockford, Ill.

(35) **AUXILIARY VENTILATOR**—Leaflet 853 from the Jeffrey Mfg. Co., Columbus 16, Ohio, covers specifications and operation of the Jeffrey Aerodyne Midget Fan, a self-contained blower or exhauster for auxiliary ventilation through tubing delivering up to 6,200 cfm.

(36) **DECREASED STORAGE COSTS** is the subject of a 16-p booklet, "The Science of Economical Shelf Storage," issued by Frick-Gallagher Mfg. Co., Wellston, Ohio. The catalog discusses benefits of Rotabin rotary shelving to store parts, tools and materials, reporting savings in floor space and material-handling costs as high as 50% or more. Design and construction features, sizes and types are pictured and described.

(37) **FLEXIBLE COUPLINGS**—78-p Catalog 51 available from the Thomas Flexible Coupling Co., Warren, Pa., offers detailed engineering and application data on a wide range of its "Flexible-Disc" couplings. Available from ⅛ to 40,000 hp and 1 to 30,000 rpm in various shaft sizes, the units are said to eliminate backlash, friction and crosspull and require no lubrication.

(38) **ELECTRIC - MOTOR INSULATION**—Bulletin G-26 offered by Dow Corning Corp., Midland, Mich. presents a detailed list of recommended Class H insulation components, with properties, specifications, applications and availability given for each. The features of Class H insulation made with Dow Corning Silicones are described briefly, with representative applications and a list of Dow Corning distributors.

(39) **FLOTATION CONDITIONING**—Bulletin A2-B3 from the Denver Equipment Co., Denver 17, Colo., explains why the Denver (Patented) Super-Agitator and Conditioner is effective in increasing flotation recovery. It outlines how short-circuiting is eliminated, horsepower consumption reduced and recirculation is handled to assure complete, uniform conditioning.

(60) **FLEXIBLE TUBING**—Catalog C2-3 from the Flexible Tubing Corp., Guilford, Conn., discusses varied applications of Spiratube ducting available in diameters from 3 to 30 in and Flexflyte tubing from 1 to 6 in, for air handling, dust collection and fume removal, etc.

(61) **HOW TO LUBRICATE** your Fafnir ball bearings is discussed in detail in Bulletin 426 offered by the Fafnir Bearing Co., New Britain, Conn. The basic reasons why lubrication is necessary and a discussion of the advantages of oil or grease are included, together with specific illustrations of bearing and housing design.

(62) **MICROWAVE RADIO SYSTEMS**—20-p informational booklet entitled "An Introduction to Microwave," providing a semi-technical description of RCA microwave equipment, is available from the RCA Victor Div., Radio Corp. of America, Camden, N. J. How microwave radio works, propagation characteristics, operational advantages, economic factors, who can use microwave, how to plan a system, selecting station sites, are among the subjects discussed.

(63) **SWITCHES**—Bulletin 5207 describes the complete line of B-2P high-capacity switches for outdoor service produced by Delta-Star Electric Co., Div of H. K. Porter Co., Inc., Chicago. The heavy duty switches utilize high-pressure contacts at clip and hinge ends without the use of threads or other complicated clamping devices and are available in 2, 3, 4 and 5,000 amp, up to 34.5 kv.

(64) **AUTOMATIC WELDER**—Operating features of the Dean automatic track-rail welder-positioner for rebuilding crawler tracks of various equipment, hardfacing or rebuilding blades or other cutting and wearing parts and fabricating various longitudinally welded sections are presented in a bulletin issued by the Dean Weld Machine, Inc., Oakland, Calif.

(65) "**INDUSTRIAL TIRE GUIDE-BOOK**" released by B. F. Goodrich Co., Akron, Ohio, shows the complete Goodrich line of tires for industrial trucks, the recommended service and many useful maintenance tips on their care.

(66) **FLEXIBLE COUPLINGS**—Bulletin CDC-52 describes standard bore flexible couplings available from Cone-Drive Gears, Div. of Michigan Tool Co., Detroit 12, Mich. Tables list capacities, specifications and selection and ordering information for flexible couplings in 22 standard bore sizes from ¾ to 6⅛ in for applications on Cone-Drive worm shafts, gear shafts and electric-motor shafts.

(67) **WELDING AND CUTTING**—Victor Equipment Co., San Francisco 7, offers Bulletin 330 covering Victor welding and cutting units to meet every requirement, including equipment and accessories for flame cutting, heating and welding.

(68) **SAFETY SHOES**—Catalog available from the Safety First Shoe Company, Holliston 5, Mass., gives complete information about Safety First steel-toe safety shoes, equipped with air-cushioned insersoles of genuine foam latex said to give a degree of comfort to safety shoes not obtainable with ordinary leather insersoles. The catalog also covers the company's regular line of "dress" and work shoes.

(69) **REBUILDING** and repairing various types of crushers with Manganal, 11%-13½% manganese-nickel steel with savings in time and money are covered in a folder issued by Stulz-Sickles Co., Newark 5, N. J. It relates how roll crushers, jaw crushers and corrugated, smooth and concave gyratory crushers can be entirely rebuilt and repaired with Manganal Bare or Special Tite-Kote electrodes and Manganal Round Applicator Bars, with procedure and application details.

(70) **HOSE CLAMPS**—Bulletin 125 covering the complete line of LE-Hi hose clamps for every industrial rubber hose application is available from Hose Accessories Co., Philadelphia 32. It includes all types and sizes, with capacities and application details.

(71) **WELDING ALLOYS**—32-p "Buyers' Guide" to complete line of All-State alloys and fluxes for welding, brazing, soldering, tinning and cutting is offered by All-State Welding Alloys Co., Inc., White Plains, N. Y. Products are listed for use with steel, aluminum and aluminum alloys, cast iron, copper and copper-bearing alloys, magnesium, nickel, stainless steel and zinc die cast.

(72) **BUILD-UP OR REPAIR** of worn dipper teeth with Manganal 11-13½% manganese-nickel steel is described step-by-step in the latest issue of the "Manganal Marketeer." Available from the Stulz-Sickles Co., Newark 5, N. J.

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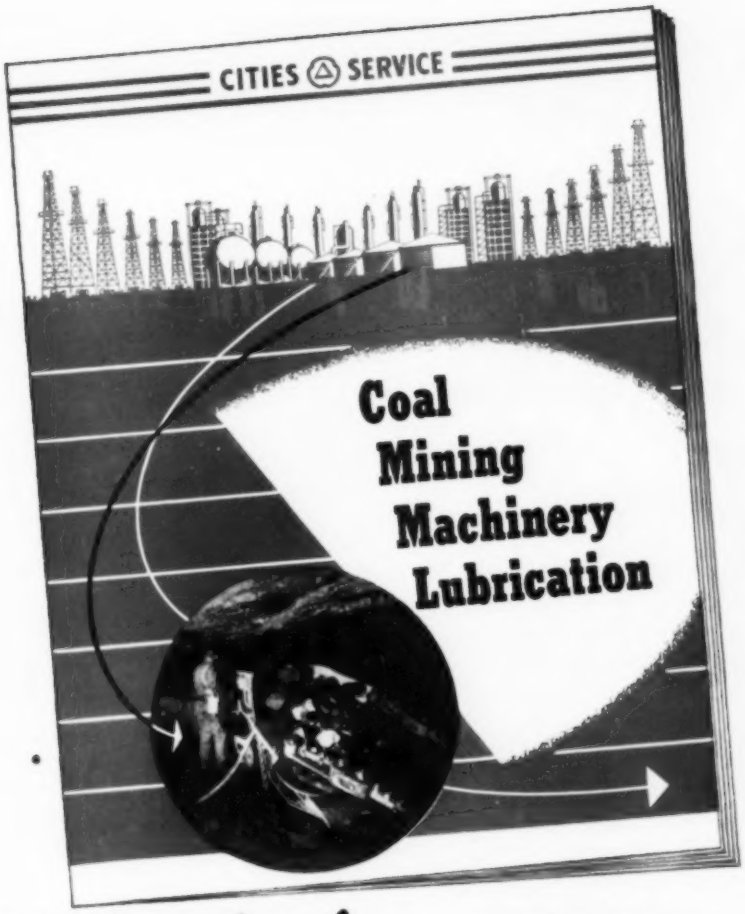
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NEWS Round-Up



Lewis Gains in Wages, Welfare

Northern group meets terms, sets wage pattern for others. More contract changes made.

What's New in the BCOA-UMWA Agreement

Dollars and Cents

1. Adds $1.90 a day to basic daily rate of $16.35 for total of $18.25. Tonnage, yardage, dead work, narrow work and machine rates are to be worked out accordingly. New rate for drillers, shooters and roof-bolting is to be $19.46.

2. Adds 10¢ per ton to the welfare-fund royalty for total of 40¢.

Non-Economic Terms

1. Seniority—Seniority is recognized. In layoffs, workers with least service are to be laid off first. Idle employees are to be recalled in order of seniority. There is to be no loss of seniority because of layoff, even if classification is changed upon re-employment, or because of casual or intermittent employment during layoff. But an employee who obtains regular employment elsewhere during a layoff and who does not return when recalled is to lose his seniority. In two- or three-shift operations, seniority with regard to work on the respective shifts is to be decided locally. Seniority grievances are to be handled through regular grievance channels. The seniority panel is to be in the joint custody of the mine superintendent and the secretary of the local union.

2. Coal lands—The contract covers all coal lands owned or leased by signatory operators or their subsidiaries. Operators are not to lease out coal lands as a means of escaping the contract terms.

3. Welfare fund—A part of the fund, based on the welfare trust's actual statistical experience, is to be set aside separately to provide pensions or annuities. The trustee designated by the UMWA is to be chairman of the trustees and chief administrative officer.

4. Suits against the UMWA—Settlement of suits and claims "which are not settled by agreement" are limited to settlement by the machinery provided in the "Settlement of Local and District Disputes" section of the contract. But if disputes and claims are national in character they are to be settled "by free collective bargaining" through the contract machinery and "without recourse to the courts."

5. Other changes—Workers at each mine are to be notified that welfare-fund payments have been made up to date. A new Federal Mine Safety Code is to be worked out. House-coal provision is to be extended to include pensioners who live within normal delivery area of the mine.

JOHN L. LEWIS AND HIS MINERS Sept. 20 pocketed a thumping wage boost and an increase in the welfare-fund levy, both to become effective Oct. 1 and to last for at least a year.

The wage rise adds $1.90 a day to the basic rate of $16.35 and the welfare increase of 10¢ a ton pushes the total contribution up to 40¢ in bituminous. In anthracite, the welfare royalty is increased 20¢ for a total of 50¢ a ton.

Extended talks between Mr. Lewis and Harry M. Moses, president, Bituminous Coal Operators' Association, set the stage for agreement on the eve of a threatened strike that would have shut most mines in the Northern Appalachian area Sept. 22. Immediately after announcement of the agreement, UMWA officials in Washington wired union district and local headquarters to call off the planned stoppage.

For the second time since 1950, agreement came without government intervention and without a nation-wide strike, though threat of a strike hung over the talks the last few days before terms were

What the New Contract Costs

A Coal Producer Sees It This Way

"Sure, the price of coal will go up. It's got to because coal producers aren't making any money now and they can't absorb a wage increase.

"We've told our customers they'll just have to pay it. There isn't any other way. We'll lose some business but we'll have to take it on the chin. Oil is underselling us now.

"The wage increase will put some coal companies out of business. Maybe that'll be a good thing. I'm not the one to say about that.

"But when all's said and done, it's better to go on and settle without a strike. My company's never made a dime out of a strike—and I don't know any companies that have."

Coal Salesmen Take This View

A District Manager—"If the price goes up, it's going to be harder to sell coal. We've already lost some good customers in the 5,000- to 10,000-ton class. They can change over to oil pretty easily, just by making a small capital investment in burning equipment. We expect to lose some more customers in this range if the price of coal goes up.

"It's a little harder and costs a good deal more to change a 20,000-ton plant over to oil. Most of our customers in that range are set with coal and I doubt they'll change to oil. Of course, some of them may take the plunge and make the capital investment. There's not much we can do about that.

"But a lot of our customers know they can't predict the price of oil. The oil people knocked off 35c a barrel last August without batting an eye. They can put that 35c back on Nov. 1 without batting an eye—or any other time. That's why we expect most of our customers to stick with us."

A Broker—"We'll sell less coal if the price goes up. But we've gone through this same thing a lot of times and we're still in business. We'll get along this time, too. But it won't be easy. In fact, it'll be damn tough."

What Purchasing Agents Say

For a Cement Company—"Every time you see a bag of cement, you see 25 lb of coal. Add 50c a ton to the price of coal, and you still don't have a big increase in the cost of cement. But when you measure that 50c against our profit margin, it makes a big difference. We use 1,000,000 tons of coal a year. A 50c increase in coal would cost us $500,000.

"Coal is our cheapest fuel, except where we can get natural gas at dump rates. Everywhere we have plants, oil is most expensive. So we're stuck with coal except where we can use gas. Sure, we'll have to pay the increase. What the hell else can we do? But we won't like it, and we'll expect our suppliers to absorb most of the increase."

For a Board of Education—"We've got 70 schools in our system. We've already converted 6 of them to oil, and we're converting the rest of them as fast as we can. And when we convert, we really change over 100% to oil—no chance for coal to get back in. The reason is, here in the tidewater region oil is cheap and it costs us a lot less to handle it. Besides, the price of coal has been going up too fast. We used to pay $3.50 a ton for steam coal—anthracite rice. Now we have to pay $10.40 on the average. Last year, we used 15,000 tons of anthracite. We'll use less just as fast as we can change over."

For a Public Utility—"We've bailed the coal industry out of its cost increases for as long as I can remember. But we're through now. We're not going to do it any more. We've been 75% on oil before, while coal strikes were going on, and we can go 75% on oil again—and stay there. I've got a big stockpile. I can use it, or I can sit on it, depending on how things go. But I'm not going to pay any more for coal."

"Building Management-Miner Teamwork Today"

What management and union men are doing to promote harmony and cooperation at the mine level was the subject of a 16-p special report in August *Coal Age*. Based on personal interviews with mine officials, union men, association officials and miners, together with comments by experienced personnel directors, the article outlines present-day difficulties and shows some of the steps taken to solve them. The article is available in a handy reprint form at 20c per copy for more than 100 copies and 25c in quantities up to 100. Sample free on request. Address The Editor, *Coal Age*, 330 W. 42 St., New York 36, N. Y.

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agreed upon in the Appalachian area.

Mr. Moses warned BCOA members not to pay the new wage scale until the Wage Stabilization Board approved it.

In a dramatic last-minute capitulation, Joseph E. Moody, president, SCPA, agreed Sept. 30 to the UMWA-BCOA pattern in behalf of a majority of his members. He signed up only a few hours before miners were scheduled to walk out of Southern pits. Earlier, he had contended that what Mr. Lewis had won elsewhere would be "economic hari-kari" for the Southerners and had said he would not recommend those terms to his principals. He said many Southern producers could not sign in good faith because they could not fulfill the commitments.

Following the settlement with SCPA, it appeared that some fraction of Mr. Moody's group would shut down their mines until market conditions made it possible to resume mining.

The new wage scale, negotiated with commercial and "captive" operators in Mr. Moses' group, shaped the pattern for agreement with operators in the Midwest and West and with anthracite producers, all of whom had made prior commitments to accept whatever terms Mr. Lewis might wring from BCOA or the Southern Coal Producers' Association.

Mr. Moses, asked what the new contract would cost, said: "We think the cost is approximately 32¢ an hour . . . The overall cost will be something less than 40¢ a ton."

The Oct. 1, 1953, date gives Mr. Lewis a fall instead of spring reopening. Though Mr. Lewis is said to have asked for a reopening closer to the steel date of July 1, Mr. Moses held out for a year-long contract.

The new wage agreement left three questions still unanswered. Those were:

1. How will the wage increase affect coal's markets?

Some bituminous producers figure the wage and welfare boosts will add 50 to 60¢ a ton to mining costs. Unable to absorb the increase themselves, they see little chance of passing it on to their customers without inviting oil and gas to move in further.

2. What happens to miners' working time?

Many miners were on two-, three- or four-day weeks before the wage increase became effective. Faced with dull markets that would turn softer with higher prices, some fraction of the industry might have to go out of business. The results: less working time for miners instead of more. All three principals in the negotiations—Mr. Lewis, Mr. Moses and Mr. Moody—are known to have talked seriously about the need for stabilizing production but the new agreement con-

(*Continued on p 156*)

Featured in This Section

Personal Notes	p 130
Obituaries	p 130
Where the Candidates Stand on Industry Issues	p 134
News Briefs and Trends	p 136
New Mine Developments	p 170
New Preparation Facilities	p 172
New Books for Coal Men	p 174
Among the Manufacturers	p 180

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Personal Notes

Frank C. Nicholson, chief electrical engineer, Glen Alden Coal Co., Wilkes-Barre, Pa., has retired because of ill health. He began his career in 1913 as electrical engineer with the Lehigh & Wilkes-Barre Coal Co., and in 1929 when the company merged with Glen Alden, he became electrical engineer for Glen Alden. He will be succeeded by **Frederick W. Jennings,** who joined Glen Alden in 1926.

Fred L. Zollinger, superintendent of the Loree collieries for 9 yr, has been named to the newly created post of assistant to the general manager of the Hudson Coal Co., at the Scranton office. **Robert von Storch** succeeds Mr. Zollinger and **Ervin Conners,** mine foreman at Loree, becomes assistant superintendent, replacing Mr. von Storch. **Darius Thomas,** company ventilation inspector, becomes foreman at Loree.

Clarence R. Holmes, deputy mine inspector for the Washington State Department of Labor and Industries for the past 3½ yr, has been named state coal mine inspector, succeeding the late **William Evans.**



Fies Made Vice President

MILTON H. FIES, consulting mining engineer since 1937, and in charge of coal mining operations since 1946, has been named vice president in charge of coal operations, Alabama Power Co., Birmingham, Ala. A native of Birmingham, Mr. Fies is a mining-engineering graduate of Columbia University and holds an honorary degree of Doctor of Science from the University of Alabama. Under his direction, the mines at Gorgas have been extensively mechanized and have achieved an excellent safety record. It was his suggestion that experiments in underground gasification of coal at Gorgas were made in conjunction with the USBM. Mr. Fies is a consulting mining engineer for the Bureau and is active in many associations. For 25 yr he was vice president in charge of operations, DeBardeleben Coal Corp.

Benjamin Henderson, vice president and general manager since 1939 of the Lehigh Valley Coal Co., Wilkes-Barre, Pa., resigned last month. His resignation, submitted Sept. 8, was accepted Sept. 19 by the company's board of directors. According to published newspaper reports, lack of an agressive sales policy on the part of the management, climaxed by the proposed sale of the company's Wilkes-Barre office building to King's College at an insufficient price, was cited by Mr. Henderson as the reasons for his sudden resignation.

Robert J. Emigh, general superintendent, Morrisdale Coal Mining Co., Morrisdale, Pa., has been appointed a Pennsylvania state bituminous mine inspector, replacing the late **Francis E. Schroyer.** Mr. Emigh will be in charge of the fourth bituminous district.

Bernard Swisher, section foreman, Dawson mine, Barnes-Dawson Coal Co., Clarksburg, W. V., retired last month after 52 yr in coal mines in West Virginia. Mr. Swisher was guest of honor at a company dinner in the Stonewall Jackson Hotel Sept. 13 and was presented with a gold watch by the company and an automatic shotgun by fellow supervisors. Mr. Swisher began his career in 1900 with the Consolidation Coal Co. and served in various capacities with that company until joining the Dawson Coal Co. in 1937. For some years he was a general mine foreman and held an excellent safety record.

H. C. Livingston, vice president in charge of operations, and **H. R. Platt, Jr.,** recently elected vice president and treasurer, were elected directors of the Truax-Traer Coal Co., Chicago, to fill existing vacancies, at a meeting of the board Sept. 17. **H. C. Piper, Jr.,** also was elected a director, to succeed his father, **H. C. Piper, Sr.,** one of the original founders of the company who now is relinquishing some of his varied business interests.

Edward T. Powell, chief engineer, Susquehanna Collieries Div., M. A. Hanna Co. since 1949, has been appointed mining engineer of the Glen Alden Coal Co., Wilkes-Barre, Pa. A graduate of Lafayette College, Mr. Powell had been associated with the M. A. Hanna since 1924. Other personnel changes announced by Glen Alden include the following: **Norman F. Becker,** former superintendent of Truesdale Colliery, has been named superintendent of the West Side Collieries, including Woodward, Lance, Nottingham and Avondale. **Joseph Reynolds,** former assistant superintendent at Truesdale succeeds Mr. Becker. **David Joseph,** formerly superintendent, Huber colliery, has been named superintendent of Collieries, in charge of Huber, Kidder, Empire, Buttonwood and South Wilkes-Barre. He has been succeeded by **John Zimmerman,** formerly assistant superintendent at Huber. **John A. Hamilton,** former superintendent of Loomis Colliery, has been made superintendent of collieries, for Truesdale, Bliss and Loomis. **Daniel Thomas,** superintendent at Bliss Colliery, has been transferred as superintendent, Loomis Collery.

Earl E. Rich, General manager, Tug

(*Continued on p 166*)

Obituaries



Dr. J. J. Rutledge

Dr. J. J. Rutledge, 85, who for 27 yr was director of the Maryland State Bureau of Mines, died Sept. 12th. A native of Illinois, Dr. Rutledge had spent his entire career in coal mining and was widely known throughout the country as one of the industry's pioneers in safety. He was connected with various individual producing companies and the USBM for many years before joining the Maryland Bureau. For some years, he was an officer of the Mine Inspectors' Institute of America and was active in many other aspects of the industry. Following his retirement as director in 1949, Dr. Rutledge had served as chief consultant to the Maryland Bureau.

Joseph J. Walsh, 78, deputy secretary of the Pennsylvania State Department of Mines in charge of anthracite operations, died in the Harrisburg Hospital Sept. 20, following a heart attack that had hospitalized him the week before. Before joining the Department of Mines in 1905, he worked in the coal mines near Pittston and later was graduated from Mansfield State Teachers College and Elmire Business College. The author of "Mine Ventilation" and "The Chemistry of Circulation," Mr. Walsh lectured frequently before the American Mining Congress, the American Institute of Mining Engineers, and Pennsylvania State College, and taught mining classes. In 1950, the Holmes Safety Association awarded him the certificate of honor for outstanding leadership in mine safety.

William J. Evans, 70, chief coal mine inspector for the state of Washington

(*Continued on p 166*)

JOY S.P.B.* CONNECTORS



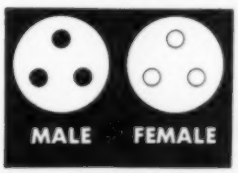
FOR PRICES SEE JOY
PRICE SHEET 5214-2

*JOY Straight Pin Bigun (S.P.B.) Connectors are built for rough everyday service. Equipped with rust-proof threaded metal coupling (see cut-away sketch) and the famous JOY two-way water seal, they can't be surpassed for performance, safety and durability . . . and because they're molded to cable as one-piece Neoprene units, they're shatter-proof, wear-resistant and highly impervious to the deteriorating effects of moisture, grime or oils. Through them power cable can be sectionalized into easily handled lengths that facilitate rapid replacements of damaged sections.

Available for A.C. or D.C. operation in current capacities to match job requirements. Choice of one through four conductors with choice of contact arrangements illustrated and described below.

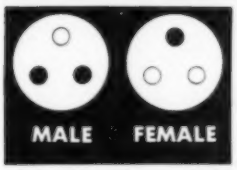
Choice of 4 Contact Styles

Rated at 600 volts maximum



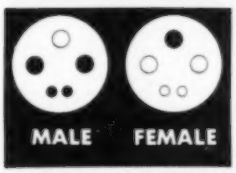
STANDARD PIN PLACEMENT

Available in single conductor design for wire sizes 14 through 1000 MCM . . . and in two, three or four conductor styles for wire sizes 14 through 4/0.



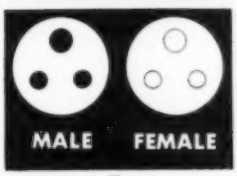
REVERSED PIN PLACEMENT

All contacts same size, however, one contact reversed in Male and Female plugs for grounding and polarization. Available in three or four conductor styles for wire sizes 12 through 250 MCM.



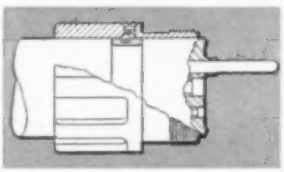
PILOT PIN DESIGN

Same number of conductors and wire sizes as listed above for reversed pin placement series, however, have two additional small "pilot-control" contacts. Supplied with these contacts shunted or carried through cable on two #10 wires.



ENLARGED PIN DESIGN

Supplied with one larger contact on Male and Female plugs for grounding and polarization. Available in three or four conductor styles for wire sizes 12 through 250 MCM.



S.P.B. CONNECTORS are easily engaged or disengaged. Threaded "fire-hydrant-type" couplings quickly and positively connect or disconnect (see sketch for details) Couplings on larger size connectors equipped with ball bearings. Damaged couplings quickly replaceable from factory stock.

PROTECTIVE NEOPRENE SLEEVE—Available for S.P.B. Connectors 2" or over in diameter. Fits over metal couplings on female style connectors. Protects exposed male threads. Will not interfere with coupling or uncoupling procedure.



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FOR PRICES SEE JOY PRICE SHEET No. 5225-2



No. PGGK—PERMISSIBLE STYLE
THREE OUTLET S. C. C. ILLUSTRATED

Ideal for all mechanized mining power transmission systems, Joy SCC's are supplied with 1, 2, 3 or 4 outlets in A.C. or D.C. current ratings to match any need. Fully protect personnel and equipment; permit power delivery through minimum lengths of sectionalized cable. Available in two styles (Permissible and Dust Resistant) both equipped with fast-acting circuit breakers. No fuses, tools or extra parts required to restore power after correcting a fault in cable. Supplied with or without pilot control circuits.



Consult a Joy Engineer

Ask him for a copy of Bulletin RV 106 on JOY Cable Vulcanizers, too.

W&D ME3469

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Stocks of Bethlehem wire rope are usually no farther away than your telephone. Warehouse facilities are geared for high-speed service on emergency calls.

Heading your way in a hurry

Ever had a job stalled by a sudden emergency need for wire rope? A job where every hour, every minute, counted?

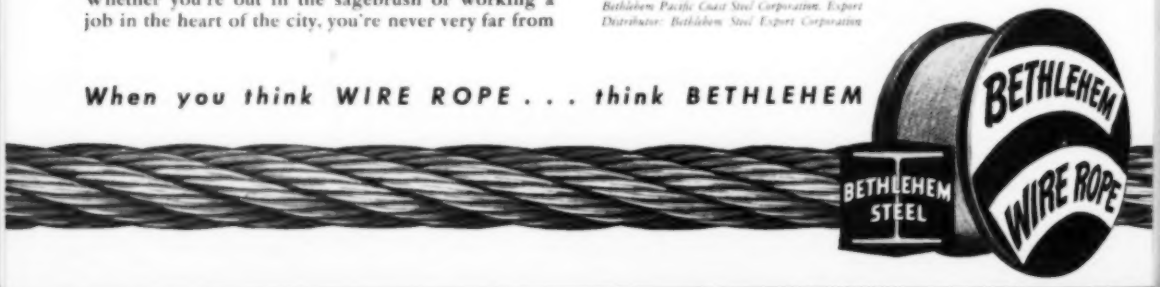
Those things happen. And when they do it's good to know that you're always near a Bethlehem mill depot or distributor. Through a large, quick-acting distribution system, Bethlehem makes it easy to get the rope you need . . . the proper size, type, and grade. Whether you're out in the sagebrush or working a job in the heart of the city, you're never very far from a large, convenient warehouse supply.

So put in a call, outline your needs, and the Bethlehem rope you want will soon be heading your way. Sound, dependable rope. There's none better. And there's no better, friendlier service than Bethlehem and its hundreds of distributors can offer you.

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When you think WIRE ROPE . . . think BETHLEHEM





in WIRE ROPE, too, extra strength demands the RIGHT KIND of muscle

Towering as high as eight feet on his hind legs, the Kodiak or Alaskan Brown Bear ranks as the most powerful animal of North America. Rugged muscle development makes him the feared and deadly fighter that he is.

In wire rope, too, the right kind of muscle is essential to ward off the destructive effects of abrasion, corrosion, bending fatigue, load strain and shock stress.

That's why in Wickwire Rope we make sure—through complete quality control—that you always get the right construction and lay of the rope...the right grade of steel and size of wire for long-lasting resistance to the rigors of your particular service.

See your Wickwire Rope distributor or contact our nearest sales office.

THE COLORADO FUEL AND IRON CORPORATION—Abilene (Tex.) • Denver • Houston • Odessa (Tex.) • Phoenix • Salt Lake City • Tulsa
THE CALIFORNIA WIRE CLOTH CORPORATION—Los Angeles • Oakland • Portland • San Francisco • Seattle • Spokane
WICKWIRE SPENCER STEEL DIVISION—Boston • Buffalo • Chattanooga • Chicago • Detroit • Emlenton (Pa.) • New York • Philadelphia

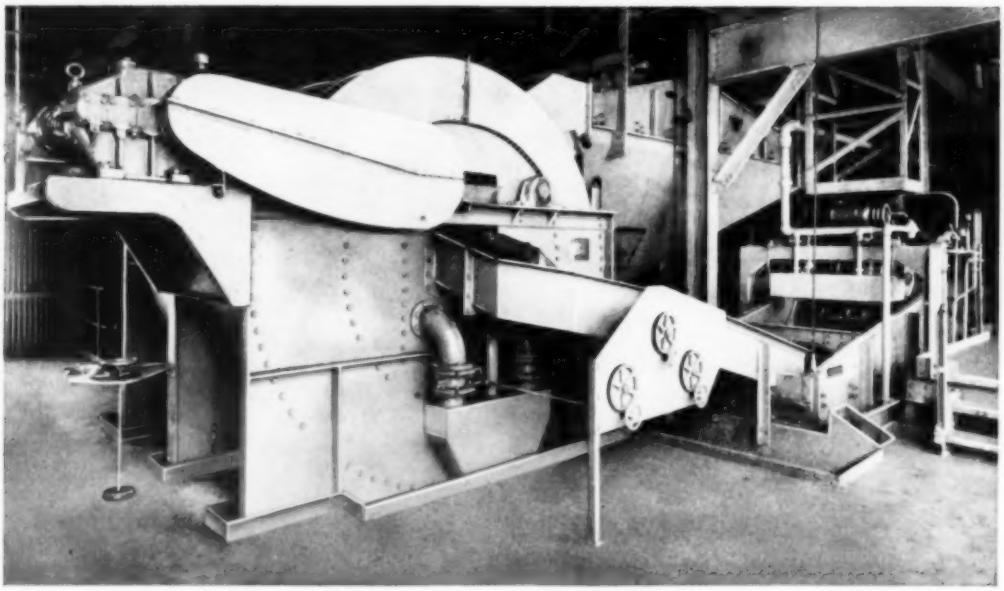
WICKWIRE ROPE
A CF&I PRODUCT

A YELLOW TRIANGLE ON THE REEL IDENTIFIES WICKWIRE ROPE

WICKWIRE ROPE

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PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION



NEMACOLIN MODERNIZES

With NELDCO Dense Media Coal Cleaning

At the Nemacolin Mine of Buckeye Coal Company the raw coal produced is high both in ash and sulphur content. In order to up-grade this coal to metallurgical requirements, the separation of the impurities by the float-and-sink method requires a bath density ranging less than 1.45 specific gravity. The picture above illustrates one of two NELDCO Dense Media Processors which clean 450 tons of 5" x ¼" coal an hour. The commercial results from this installation are within 1% of theoretical laboratory float-and-sink determinations.

The Nemacolin plant is typical of many NELDCO Dense Media installations in this country and in Europe where improved efficiency and improved control of coal quality has been made possible by this modern, efficient and economical coal cleaning system.

The entire modernization program at Nemacolin including plant design, equipment and erection was handled by the Davis organization.

If you have a coal cleaning problem we shall be very glad to have the opportunity to work with you.

We design and build coal cleaning plants in any size—any capacity, either single or two-stage separations to suit your conditions.

NELDCO

Standardized Packaged Coal Cleaning plants are available for single-stage cleaning in six sizes—capacities 50 to 325 tons per hour.

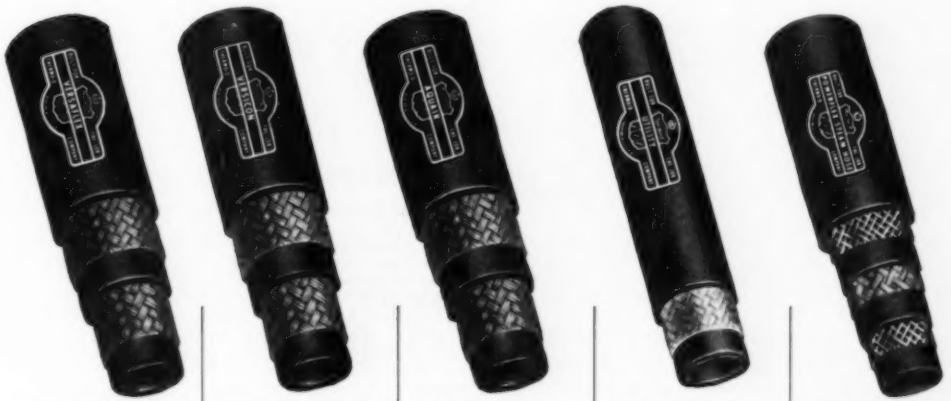
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DESIGNERS AND BUILDERS OF COAL CLEANING PLANTS USING THE DENSE MEDIA PROCESS

now! 5 basic types of Thermoid hose do the work of eighteen!

The new Thermoid line of molded hose cuts handling time and storage costs 70% or more in a wide variety of industrial and commercial uses! Thermoid's "Basic Five": Versaflex . . . Versicon . . . Aquair . . . Utility . . . Powerflex . . . now combine simplification and versatility with Thermoid top quality construction. And Thermoid's new standard color identification eliminates confusion in storage and stock selection!



VERSAFLEX
Multi-purpose hose built to withstand higher pressures. Recommended for butane, propane, insecticides, etc. Color code: *Red.*

VERSICON
A true all-purpose hose for virtually every type of air, gas or liquid. Color code: *Brown.*

AQUAIR
Rugged, dependable hose for handling air, water, welding gases. Color code: *Green*.*

UTILITY
Most practical hose for air, water and illuminating gases at pressures from 75 to 125 psi. Color code: *Black.*

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Designed specifically for superheated steam at pressures from 100 to 200 psi. Color code: *Black.*

You can definitely simplify your buying, inventory, storage and stock selection with Thermoid's color-coded "Basic Five". Get full information from your distributor or write direct for Hose Catalog No. 3680. It's yours for the asking.

**Also furnished with Red Cover for acetylene*

Conveyor & Elevator Belting • Transmission Belting
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Before Election Day, Nov. 4 . . .

See Where the Candidates Stand

VOTING IS YOUR PRIVILEGE as a citizen of the United States. You'd fight if anybody tried to take that privilege away from you.

But it takes more than just voting to make a good citizen. To be a good citizen, you must be an informed voter.

To help you be an informed voter on Election Day, we've picked out the issues that bear most weight with coal men and pulled together the best things the two parties and their presidential candidates have said about those issues up to our press time. You'll find it all in the columns that follow.

Now it's up to you. See where the parties and their candidates stand, make up your mind—and then vote your convictions Nov. 4.

LABOR AND TAFT-HARTLEY

Republican platform—"Regular and adequate income for the employee together with uninterrupted production of good and services through the medium of private enterprise are essential to a sound economy. This can only be obtained in an era of industrial peace. With the above in mind, we favor retention of the Taft-Hartley Act. . .

"We urge the adoption of such amendments to the Taft-Hartley Act as time and experience show to be desirable and which further protect the rights of labor, management and the public."

Gen. Eisenhower—"Workers must get the highest possible wages that a prosperous industry can afford to pay them, and then we will have a prosperous agriculture because we will eat better and we will eat more." *Plymouth, Ind., Sept. 15.*

"I know the Taft-Hartley law might be used to break unions. That must be changed. America wants no law licensing union-busting. Neither do I. . .

"These principles are important in labor legislation:

"1. The encouragement of collective bargaining.

"2. The right to strike.

"3. Advance notice before a strike is called.

"4. A requirement that both unions and employers live up to their contracts.

"5. The assurance that members of unions get a regular report on the organization's finances. . .

"Injunctions, seizures and other such devices will not settle the underlying fundamental problems which cause a strike." *New York City, Sept. 17.*

Democratic platform—"We believe that to the widest extent consistent with the public interest, management and labor should determine wage rates and conditions of employment through free collective bargaining.

"We strongly advocate repeal of the Taft-Hartley Act. [It] has proved to be inadequate, unworkable and unfair . . . We pledge to continue our efforts so that government programs designed to improve fair labor standards shall prove a means of assuring minimum wages and hours and protection to workers, consistent with present-day progress."

Gov. Stevenson—"The only legitimate purpose of a federal labor-relations law is to make private bargaining work better. And that purpose has not, in my judgment, been served by the Taft-Hartley Act. . .

"I don't say that everything in the Taft-Hartley Act is wrong. It isn't. And moreover I'll say frankly that I don't think it's a slave-labor law either. But I do say that it was biased and politically inspired and has not improved labor relations in a single plant.

"We must have a new law. . . We can best remedy the defects in the old law by scrapping it and starting over again. . . I should like to suggest five general principles as the basis for a new labor-relations law. . . :

"1. The law must accept labor unions, like employer corporations, as the responsible representatives of their members' interests. . .

"2. Labor unions must conform to standards of fair conduct and equal protection in the exercise of their stewardship. . .

"3. A new federal labor law must outlaw unfair bargaining practices by companies or unions. . . We must forbid such practices as jurisdictional strikes and strikes or boycotts attempting to force an employer to deal with one union when another has been certified. . .

"4. Rejection of the labor injunction. . .

"5. New methods must be found for settling national emergency disputes . . . We cannot tolerate shutdowns which threaten our national safety, even that of the whole free world. The right to bargain collectively does not include the right to stop the national economy. . . Where the government must intervene in these private disputes, its purpose must be not just to stop the strike, but to see that the dispute gets settled. . . What we need is a completely new law. . . Its purpose should be to keep these cases out of the White House, not to put them in. . . Congress should give the President a choice of procedures. . . : seizure provisions geared to the circumstances, or arbitration, or a detailed hearing and recommendation of settlement terms, or a return of the dispute to the parties. . . Such a law would leave the obligation to settle these disputes where it belongs—and that's with the parties. But it would not straitjacket this settlement process." *Detroit, Mich., Sept. 1.*

"There are several devices, in addition to the injunction, that are available. In unfair labor cases, there is the cease-and-desist order; in unfair-labor practice cases, there are the criminal procedures; there are criminal procedures in violence cases and there are damage remedies for tort cases. . . I don't think, in other words, that the labor injunction is necessary." *Springfield, Ill., Sept. 16.*

TAXES AND FISCAL POLICY

Republican Platform—"We advocate the following tax policies:

"1. Reduction of expenditures by the elimination of waste and extravagance so that the budget will be balanced and a general tax reduction can be made.

"2. An immediate study directed toward reallocation of the fields of taxation between the federal, state and municipal governments so as to allow greater fiscal freedom to the states and municipalities . . .

"3. A thorough revision and codification of the present hodge-podge of internal-revenue laws.

"4. Administration of the tax laws free from politics, favoritism and corruption. . .

"We favor reasonable depletion allowances. . .

"Our goal is a balanced budget, a reduced national debt an economical administration and a cut in taxes."

Gen. Eisenhower—"This country can build a solid economy where inflation and an ever-rising cost of living do not rob the people of their savings, their life insurance, their social security and their pensions." *Miami, Fla., Sept. 2.*

"I shall intensify my attack . . . against the heedless policies that nullify our thrift and erase our savings by inflation; against federal deficits and the failure to live within our means; against waste of our resources and our money." *Atlanta, Ga., Sept. 2.*

"We have seen spending that can be described only as crazy . . . governmental spending with a budgetary estimate of $85.-000,000,000, of which some 10 to 12 to 14 billion is even over and above all the taxes they charge us today . . . Now, much of that expenditure is not necessary at all." *Birmingham, Ala., Sept. 3.*

"Until we get business brains in a $60,000,000,000 business [i. e., defense]—and I mean business brains that will be respected by the Congress—we are not going to save the money that we can." *Cleveland, Ohio, Sept. 9.*

Democratic Platform—"We believe in fair and equitable taxation. We oppose a federal general sales tax. We adhere to the principle of ability to pay . . . As rapidly as defense requirements permit, we favor reducing taxes, especially for

. . . Then Vote Your Convictions

people with low incomes. But we will not imperil our Nation's security by making reckless promises to reduce taxes. We deplore irresponsible assertions that national security can be achieved without paying for it. . . We pledge continued effort to the elimination of remaining loopholes.'

Gov. Stevenson—"I have the reputation in Illinois of being a hard man with a penny." *Jumping Brook, N. J., Aug 27.*

"Once the defense effort has fulfilled its objectives . . . very substantial reductions in the budget will ensue automatically. My guess is that these will come, or will begin to be apparent, or will be conspicuous, in fiscal 1953 . . . But the amount of the cut I am not prepared to indicate." *Springfield, Ill., Sept 16.*

GOOD GOVERNMENT

Gen. Eisenhower—"We will establish efficiency in government in line with the Hoover Commission. . . " *Kansas City, Kan., Aug. 21.*

"I have said, and will say again and again, that there is only one issue in this campaign. That issue is 'the mess in Washington,'" *Philadelphia, Pa., Sept. 4.*

Gov. Stevenson—"Everybody is for economy, efficiency and honesty and against waste, sin, corruption and communism. . . . I do know that sound government ends when the leaders of special groups call the tune, whether they represent farmers, labor or capital, veterans, pensioners or anyone else." *Los Angeles, Cal., Sept. 11.*

"There have been thieves and scoundrels, men who have betrayed their trust. I say that such men must be identified and punished without mercy." *Phoenix, Ariz., Sept. 12.*

FEDERAL POWERS

Gen. Eisenhower—"We will . . . see that this federal government is not taking over functions that it has no business performing. They should be returned to the states and municipalities." *Kansas City, Kan., Aug. 21.*

"When you do bring in the government, let us bring it in where it has to be brought in only for the protection, the help, the assistance of everyone of the 150,000,000 people, but let's keep it in its own proper functions and not let it reach our lives to tell us what to do." *Birmingham, Ala., Sept. 3.*

Gov. Stevenson—"I believe most deeply that the roots of good government in this country lie in clean, honest, efficient local and state government." *Jumping Brook, N. J., Aug. 27.*

"In Illinois I have worked to make the state government responsive to the needs of the people so that it would not be necessary for them to turn everlastingly to Washington for help. I like to think that people are becoming more and more conscious of the role of the states in our federal system—more and more conscious that they will save money by doing the jobs at home than by screaming about waste and extravagance in Washington." *New York City, Aug. 28.*

CONTROLS

Republican platform—"We believe in combatting inflation by encouraging full production of goods and food and not through a program of restrictions."

Democratic platform—"We shall strive to reduce the injury done to the American people—especially to the white-collar workers and fixed-income families—by the weakening amendments which the Republicans in Congress have forced into our anti-inflation laws. We pledge continuance of workable controls so long as the emergency requires them."

Gov. Stevenson—"We will not abandon our free enterprise system. We shall oppose all attempts to limit its freedom, whether by centralized government or by private monopoly." *Los Angeles, Cal., Sept. 11.*

PUBLIC POWER

Republican platform—"We favor greater local participation in the operation and control, and eventual local ownership, of federally sponsored reimbursible water projects. . . . We vigorously oppose the efforts . . . to establish all-powerful socialistic valley authorities."

Gen. Eisenhower—"I see little use in saving the United States to see it wash down our rivers to the sea." *Kansas City, Kan., Aug. 21.*

Democratic platform—"We denounce all obstructionist devices designed to prevent or retard utilization of the Nation's power and water resources for the benefit of the people, their enterprises and interests. . . . We pledge the continued full and unified regional development of the water, mineral and other natural resources of the Nation."

Gov. Stevenson—"You see power from federal projects form the basis for greater farm output and new and expanded private business." *Cheyenne, Wyo., Sept. 7.*

"What might be desirable in one section of the country might be ineffective elsewhere. I wouldn't say for a moment that TVA was the solution for the Columbia River problem." *Portland, Ore., Sept. 9.*

"Water for irrigating crops, power for homes and farms and industries—these are the results of public investment and they are the lifeblood of the Northwest. . . . If the government had not built [these dams], they would not have been built at all. Hard American common sense concludes that where private enterprise is unable or unwilling to develop our resources, the government should." *Seattle, Wash., Sept. 9.*

SOCIAL SECURITY AND OTHER FEDERAL BENEFITS

Republican platform—"We shall work to achieve a simple, more effective and more economical . . . administration."

Gen. Eisenhower—"The middle way today . . . assumes that all Americans of all parties have now accepted and will forever support what we call social gains, security . . . in old age, insurance against unemployment, equal opportunity for all . . . the education of our young, decent housing, the rights of working men and working women to be productive, the right of each of us to earn what he can and save it as far as taxes will let him . . . adequate insurance against disaster. But all of those things . . . we call security measures and social gains. They are . . . a solid floor." *Boise, Idaho, Aug. 21.*

"I am opposed to a fedrealy operated and controlled system of medical care, which is what the Administration's compulsory health insurance scheme is in fact." *New York City, Sept. 14.*

Democratic platform—"We favor further strengthening of old age and survivors' insurance [and] complete elimination of the work clause."

Gov. Stevenson—"I'm not talking just about bringing more people under Social Security and raising the retirements to a more reasonable level. There is far more in our concept of Social Security. There is the federal state-local health program . . . a sound program to reduce the financial hazards of serious illness . . . (and I don't mean what is called 'socialized medicine,' either) . . . the kind of program which will go beyond unemployment insurance and will tackle the problem of unemployment itself. . . . When we talk of Social Security, we talk of keeping the core of Social Security strong—not just of insurance against insecurity but of eliminating the causes of insecurity." *Flint, Mich., Sept. 1.*

"I look forward to an America which can take proper care of its aged and its invalids and which can provide strong and expanding Social Security for all workers. . . . I endorse . . . a stronger system of unemployment insurance." *Los Angeles, Cal., Sept. 11.*

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News Briefs and Trends

Get Oil Now, Home Users Told

East Coast homeowners using oil for heating should fill their tanks immediately to avoid a possible shortage this winter, Ed Warren, Deputy Petroleum Administrator in Washington, urged early last month. A shortage of home-heating oil—and of kerosene and diesel fuel as well—is a possibility if the East Coast winter is normally cold, and "the situation will be very tight indeed" if the winter is colder than normal, Mr. Warren emphasized.

New Holmes Safety Council Organized in West Virginia

A Council of the Joseph A. Holmes Safety Association composed of seven new chapters was organized at a meeting in Beckley, W. Va., Aug. 27. J. J. Forbes, director of the USBM and ex-officio president of the Holmes Association, presented charters to the new council and chapters, which represent 12 mines in the area and have a combined membership of 4,500. In addition to Mr. Forbes, speakers at the ceremonies were: C. R. Bourland, vice president, The New River Co; L. T. Putnam, vice president, Raleigh Wyoming Mining Co.; H. A. Quenon, division manager, Coal Div., EG&FA; A. J. Pugh, general superintendent, Lillybrook Coal Co.; Joseph Bierer, acting chief of the W. Va. Department of Mines; James Westfield, chief, Health and Safety Div., USBM; E. E. Quenon, USBM, Mt. Hope; and Larkin Philpott, UMWA. Mines represented by the new chapters are: Stanaford Nos. 1 and 2, and Cranberry mine, The New River Co.;





COAL MEN ON THE JOB . . . Timtony Mine, Left Fork Fuel Co., Quinwood, W. Va.

TOP PHOTO: Ralph Sears (left), section foreman; M C. Hawkins, chief engineer; Paul Tincher, section foreman; M. W. Davis, supply clerk; Harry Woolridge, Alex Moore, Leo Dorman and Elmer Underwood, section foremen; J. V. Miller, general superintendent; and W. E. Sellards, president.

BOTTOM PHOTO: Henry Withrow (left), Ed Garrett, Lonzo McCutcheon and Blaine Thomas, section foreman; Earl Gold, general night foreman; Walter Lyttle, chief electrician; Dave Byrce, general day foreman; and Floyd Trillis, engineer of general mining practice.

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DRIES SUCH COAL WITH SO LITTLE DEGRADATION!

Only the Peterson TFR* Filter gives you this fine dried coal, this ultimate moisture reduction without excessive degradation. The TFR* method combines top feed with high frequency vibration of the filter cake and discharge under vacuum. No excessive degrading force is used. You get coal free of chunks, slabs; coal that intermixes freely; coal that looks treated in loaded cars. It makes water clarification cheaper and easier, and reduces stream pollution.

Peterson makes conventional disc filter as well as the TFR.* Our design is based on 37 years of engineering experience in this field, half of it spent designing and developing many other outstanding filters now on the market.

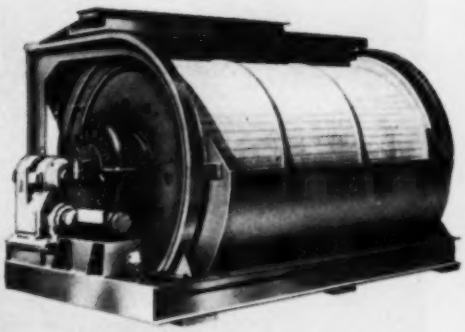
SEE HOW THE TFR WORKS – SEND FOR POCKET MODEL

With the actually-moving "Pocket Model" you can "operate" the TFR* filter yourself, and see how it works, how it gets the coal so fluffy and dry, in a continuous intermixed ribbon. Let us send you the "Pocket Model" gratis today with full information on every detail of the TFR* filter.



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PETERSON TFR* FILTER



NOT JUST ANOTHER VACUUM FILTER . . .

Here are the distinctive features of the TFR Filter.

Lowest Moisture Without Degradation

Air brushes the moisture off—high frequency vibration squeezes more moisture out of the cake. No flinging or impinging action assures little degradation and low maintenance with the slow-moving drum, at 2 MPR (two minutes per revolution).

No Filter Cloths

Stainless steel Tri-Rod screens last for years without replacement. No Blinding. Slot openings stay clear, assuring constant results over months of operation.

Surge Overflow for 100% Overload

The Top Feed Reservoir has surge overflow, permitting unattended operation. Excess feed simply overflows back to the circuit with no interruption. Fluctuations in feed are automatically taken care of in the reservoir by a change in pool level. Start and stop filter under full load.

No Blow-Back

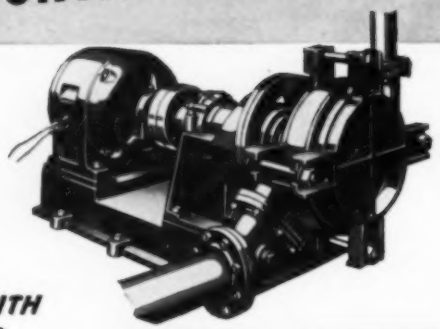
The cake is "discharged under vacuum" so there is absolutely no release of moisture at discharge.

Handles Coal from ⅜″ x 0 to 20 mesh x 0

The wide range of sizes that can be handled simultaneously on the TFR* give uninterrupted production, and yet minimum surface moisture, clear effluent and minimum operating cost.

*TFR—Top Feed Reservoir—Patented and Patents applied for.

Longer Hours of... CONTINUOUS SERVICE



WITH A **MORRIS** TYPE R SLURRY PUMP

The 4 features of the Morris Type R Slurry Pump mean low-cost operation... minimum "lay up" time.

1. **Easily dismantled**—Impeller and shaft sleeve are renewable without disturbing piping or bearings.

   Four easy-to-get-at outside clamping bolts hold impeller, liner, shell and cover firmly in place.

2. **Simpler design**—The Morris Type R Slurry Pump has no troublesome internal bolts or studs.

   Gland is under suction pressure only. Hence, it's less vulnerable to abrasive solids . . . less subject to packing troubles.

   Four adjusting screws close the worn clearances on the suction side of impeller. This adjustment moves the entire rotating assembly as a unit.

3. **Corrosion-abrasion resistant**—You may have the Morris Type R with its moving parts in any of various metal alloys, depending upon the kind of slurry you handle. Parts are quickly interchanged.

4. **Shell is interchangeable for right or left-hand rotation**—Permits 72 different combinations of suction and discharge nozzles.

FREE TECHNICAL SERVICE—Morris Engineers have been building pumps for more than 80 years. They will be glad to recommend the pump best suited to your needs. No charge or obligation.

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LESS MAINTENANCE...
LESS LAY-UP TIME...
and LONGER HOURS OF CONTINUOUS OPERATION

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MORRIS *Centrifugal Pumps*

COMING MEETINGS

Coal Mining Section, National Safety Congress and Exposition: annual meeting, Oct. 20-24, Conrad Hilton Hotel, Chicago.

Illinois Mining Institute: 60th annual meeting, Oct. 24, Hotel Abraham Lincoln, Springfield, Ill.

National Coal Association: annual convention, Nov. 10-12, Waldorf-Astoria Hotel, New York.

Coal Exporters' Association of the United States, Inc.: annual meeting and luncheon, Nov. 10, Waldorf-Astoria Hotel, New York.

Kentucky Mining Institute: annual meeting, Nov. 13-14, Phoenix Hotel, Lexington, Ky. (Information from A. D. Sisk, secretary-treasurer, Box 680, Lexington, Ky.)

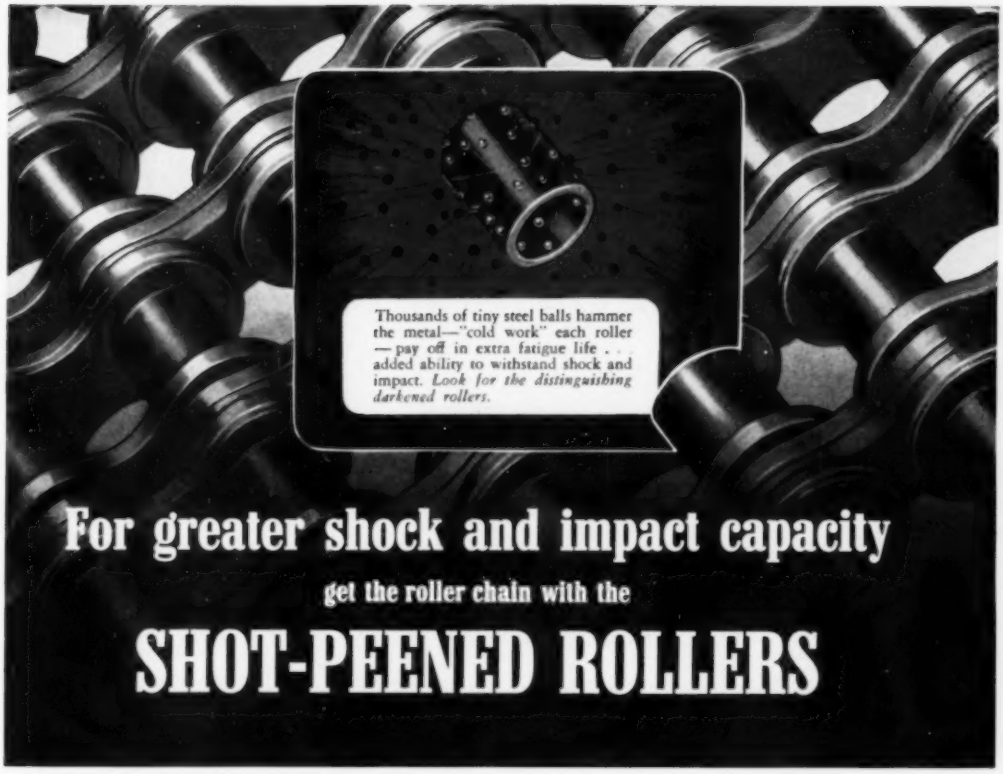
Glen Rogers No. 2, Edwight No. 1, Nos. 5 and 6 mines, Raleigh Wyoming Mining Co.; Eccles Nos. 5 and 6 mines, Stotesbury Nos. 8 and 11 and Helen No. 9, Coal Div., EG&FA.

Power Expansion Boosted; 42-Million New Kw in 4 yr

The Nation's projected expansion of electric-generating capacity in the next 4½ yr has been raised by 10 million kw and now represents an increase of 42 million kw over the supply of 75 million kw available on Jan. 1, 1952. The new goal, set by the National Production Authority, is 117 million kw by the end of 1956, as compared with its previous aim of 107 million kw announced last March. The expansion program involves the large commercial utilities, which produce 95% of the electrical energy used by the public, and does not affect industrial or small private plants.

W. Va. University to Hold Coal Economic Conference

Industry leaders from various states are expected to be present Oct. 10 for a Conference on Economic Research in the Bituminous Coal Industry to be held at West Virginia University, Morgantown. Principal speakers will include L. C. Campbell, vice president, Coal Div., EG&FA, and NCA president, who will discuss economic factors in coal production management; M. L. Patton, vice president, Truax-Traer Coal Co., who will evaluate coal marketing and utilization elements; and J. J. Foster, assistant to the president, Island Creek Coal Co., who will appraise problems and responsibilities of coal-company executives. Joseph Pursglove Jr., vice president-research, Pittsburgh Consolidation Coal Co., will be the main speaker at the conference banquet in the Hotel Morgan, with C. J. Potter, president of the Rochester & Pittsburgh Coal Co., presiding. It is hoped that the conference will indicate possibilities for progress from further economic research by the University and other organizations in and out of the industry, reported Dean R. W. Coleman.



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Lock-type Bushings increase ability to withstand severe operating conditions



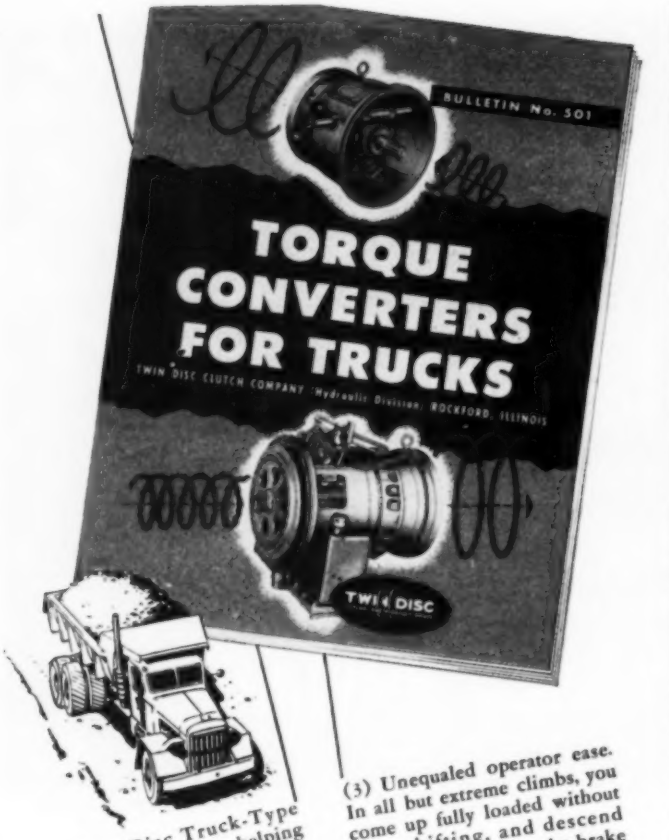
No partial bearing here — bushing fits securely

A special manufacturing process securely locks the inside sidebars on the bushing, preventing lateral movement of the sidebars and eliminating a common cause of stiff chains. This Link-Belt development is applied on roller chains through 1" pitch and double pitch roller chains through 2" pitch. 12,698

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Twin Disc Truck-Type Torque Converters are helping set new standards for operator ease, trip time and low maintenance in open pit mining. In mine after mine where loads are big and hauls steep, trucks equipped with Twin Disc's Converters have increased operating efficiency, cut hauling costs through triple advantages. Only Twin Disc Truck-Type Hydraulic Torque Converters provide these exclusive advantages: (1) Highest (up to 6-to-1) torque multiplication, (2) Torque Converter braking, (3) Unequaled operator ease. In all but extreme climbs, you come up fully loaded without gear shifting, and descend empty without using the brake pedal!

Write for newest Truck-Type Torque Converter Bulletin (No. 501) to see which of Twin Disc's two converters—Model CF for short, steep hauls or Model DF (with direct drive) for longer hauls with intermittent climbing and descending —fits your requirements. Or contact your nearest Twin Disc Factory Branch.

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EQUIPMENT APPROVALS

Three approvals of permissible equipment were issued by the U. S. Bureau of Mines in August, as follows:

Goodman Mfg. Co.—Type 2400 cutting machine; one 30- and one 50-hp motor, 250 v, DC; Approval 2-872; Aug. 21.

Joy Mfg. Co.—Type AD2 auger drill; one 40-hp motor, 220/440/500 v, AC; Approvals 2-873 and 2-873A; Aug. 21.

Goodman Mfg. Co.—Type 2410 universal cutting machine; one 30- and one 50-hp motor, 250 v, DC; Approval 2-874; Aug. 21.

Three CHS Groups Seek to Guard Commercial Tonnages

Coal Heating Service retailers in Milwaukee, St. Paul-Minneapolis and Dayton last month simultaneously launched well-organized efforts to protect and expand their commercial coal business with specially devised "Commercial and Small Industrial Plant Modernization" programs. The meetings, attended by retailers and representatives of burning-equipment manufacturers, producers, shippers and railroads, featured presentation of a local "demonstration kit" of a series of local installations in which coal, equipment and plant layout have been combined to achieve superior results. The new program grew out of cooperative planning by the retailers and the CHS Div. of the National Coal Association to extend to commercial coal the same benefits now available to domestic coal through CHS. It is designed to give the retailer a new, easily handled, effective sales approach to sell not his product alone but the complete package of coal used in modern equipment in well-engineered plants.

Pa. Meets Rank Teams in Anthracite and Bituminous

Teams from the National No. 3 mine of the U. S. Steel Co. and the Locust Summit central breaker of the Philadelphia & Reading Coal & Iron Co., last month emerged as the top teams in the bituminous and anthracite fields, respectively, at separate first aid contests sponsored by the Pennsylvania Department of Mines, in cooperation with the UMWA, USBM and coal mining companies.

In the state-wide bituminous meet held in Ebensburg Sept. 6, the National No. 3 team scored 99.600 to win $350 in cash, a cup donated by the Mine Safety Appliances Co., safety lamps from the state department and a U. S. flag. Runner-up teams, in order of ranking, were: Robena slope mine, U. S. Steel Co.; Allison No. 9 mine, Hillman Coal & Coke Co.; and Montour No. 10 mine, Pittsburgh Coal Co., Div. of Pittsburgh Consolidation Coal Co.

At the eighth annual anthracite Safety Day and First Aid Contest held at Dallas Sept. 20, the Locust Summit team, scoring 99.80, received the John Ira



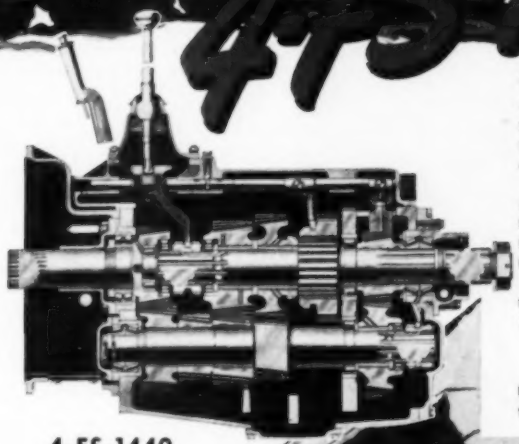
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In keeping with its tradition of setting the pace with "The Best for the Biggest," Fuller announces its new 4-FS-1440 Transmission with closely spaced ratios for use with truck-type torque converters. This new unit makes new load-and-road performance possible in heavy duty service.

Built to deliver the power from the biggest automotive diesel engines now available plus ample capacity for high torque multiplication from the most advanced torque converters, the new 4-FS-1440 puts up to 400 hp. to work efficiently and dependably.

For maximum service plus maximum versatility in the toughest of heavy hauling, investigate the new 4-FS-1440. Write for performance and application data.



4-FS-1440

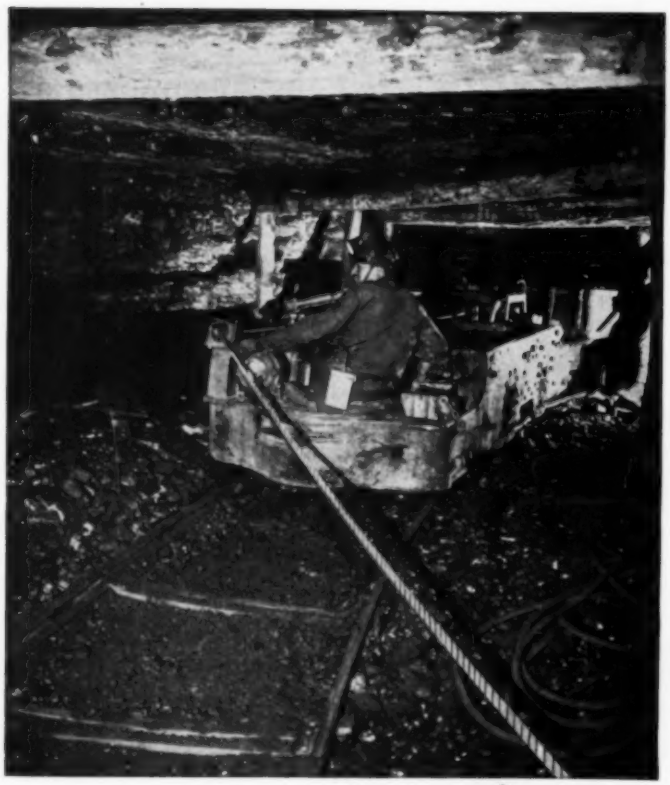
VITAL STATISTICS

Hp. handled—400. Speeds forward, 4: first, 1.98; second, 1.40; third, 1.00; fourth, .71. Reverse, 1.61. Weight 775 pounds.



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P&R Office Gets First Flag In Red Cross Blood Program

THE FIRST AWARD ever made to American business or industry of a flag signifying 100% employee donor participation in the Red Cross blood program was received by the Philadelphia & Reading Coal & Iron Co. Sept. 17 at a luncheon for the company's Philadelphia employees and Red Cross officials. Shown above are Rear Admiral R. E. Schuirmann, USN (ret), who made the presentation, Howard Price, vice president and secretary of the company, and Edward A. Lynch, director of personnel. The 125 employees in Philadelphia either gave blood, or if not able to donate, enlisted a substitute donor, through the "Ralph E. Taggart Memorial Blood Bank," named in honor of the former company president who died last year.

Thomas Trophy, with each member awarded individual cups and $25 in cash. Ranking of other leading teams were: Bliss colliery, Glen Alden Coal Co.; Hazleton shaft colliery, Lehigh Valley Coal Co.; Midvalley colliery, Hazle Brook Coal Co.; Pine Ridge colliery, Hudson Coal Co. and Westmoreland colliery, Lehigh Valley Coal Co.

Two Associations Hold Kentucky Safety Meets

Teams from the Closplint mine of the Consolidation Coal Co. (Ky.), Div. of Pittsburgh Consolidation Coal Co., made a clean sweep of the three contests at the Annual Mine Rescue and First Aid Contest of the Harlan Mining Institute held last month at Harlan, Ky. In the mine rescue contest, the Benham mine of Wisconsin Steel Co. placed second, followed by the Lynch mine of the U. S. Coal & Coke Co., and another team from the Benham mine. The Derby mine, Stonega Coke & Coal Co., was second in the first aid contest, followed by Stonega's Glenbrook mine. A Closplint team also placed first in the colored division.

In the mine rescue contest at the an-

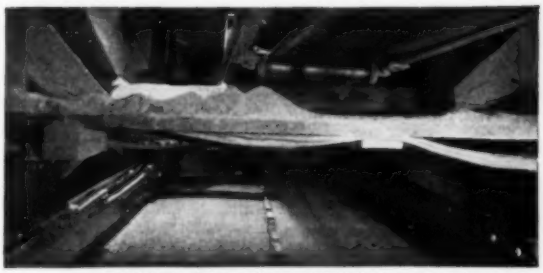
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THERMO-DECK Heating Unit

NO "TIME OUT" to clear fine or medium mesh screen cloth! You can screen fine, moist non-combustible materials *continuously* with new *Thermo-Deck* heating unit.

INCREASED CAPACITY! Heated screen cloth *remains* open, permitting more tonnage through the screen and better separation.

LOWER COSTS! Operating records show that heated screen cloth lasts up to three times as long when cloth does not have to be pounded free of blinding material. The *Thermo-Deck* heating unit can be easily applied in the field. Your nearby A-C representative can give you more details. Allis-Chalmers, Milwaukee 1, Wisconsin.



POWER ON — *Thermo-Deck* heating unit keeps screen cloth clear on screen handling fine, moist material.



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SuperDuty Holds Costs of Cleaning to Minimum



Production of high grade washed coal in the fine sizes is most profitable when the cleaning is done by SuperDuty Diagonal Deck Tables.

Removal of slate, shale, pyrite, gravel and other impurities is exceptionally efficient—so much so that SuperDuty Tables are recognized for optimum performance under any cleaning conditions to be met.

The SuperDuty is used on either bituminous or anthracite coal. It is most efficient on sizes from 3/4" down to 48 mesh. Substantial cleaning is accomplished over the very fine mesh range. Depending on particle size and washability characteristics, capacity in any application will readily meet the economics of your particular job.

Proof of SuperDuty performance is found in the fact that almost every important installation since World War II has included some of these profitable tables.

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CONCENCO SPRAY NOZZLES

These handy nozzles are simple, flexible and economical. All you do is drill your holes, clamp on and get results. They can be definitely aligned for washing, sluicing or spraying according to need. They are removed or replaced in a moment's time.

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CONCENCO PRODUCTS

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nual safety day of the Western Kentucky Mining Institute, held in Madison Sept. 13, the Fies mine of the Miners Coal Co. took top honors, followed by the Pleasant View and East Diamond mines of the West Kentucky Coal Co. In the first aid contest, winners were: Briar Creek mine, Crescent Coal Co.; the Christian County mine of the Williams Coal Co.; and Moss Hill mine, Bell & Zoller Coal & Mining Co. The Pleasant View mine also took first place in the first aid contest, colored division, with the Sturgis mine of the Poplar Ridge Coal Co., second.

And For Your Information . . . .

Its millionth hospital and doctor's bill was paid by the UMWA Welfare and Retirement Fund by a check mailed Sept. 16 to cover the birth of twin boys at a Beckley, W. Va., hospital. The Fund has paid out more than $80 million to meet the million hospital and medical bills submitted under the present regulations since July 1, 1950, officials reported.

The Imperial Coal Corp. announced last month that its 1952 4-yr scholarship offered annually to employees or their sons for engineering study at Penn State College had been awarded to Alexander P. Maruschak, of Madeira, Pa., a June graduate of the Moshannon Joint High School. Mr. Maruschak's father was employed by the company as a miner for several years until his death last spring. This is the fourth consecutive year in which the company has offered the awards.

Electric power in the United States by 1964 will have increased over four times over what we had at the beginning of World War II, predicted A. A. Johnson, electric utilities engineering manager for



COAL MEN ON THE JOB . . .
Johnstown Coal & Coke Corp.

W. H. SEELINGER (left), general superintendent, West Virginia operations; and P. W. Galeener, superintendent, Crichton No. 4 mine, Nicholas County, West Virginia.



For Heavy, Exposed Gears Sinclair Jet Lubricants . . .

Have Extreme Pressure Quality!

Retard Wear!

End galling of gear teeth!

Will *not* thin out at high temperatures!

Maintain lubrication at frigid temperatures!

Last longer!

Resist washing out . . . throwing out . . . channeling out!

Reduce lubricant consumption!

Stretch application schedules for hard-to-reach gears!

Help to lower power consumption!

Do *not* require heating for application!

Save you money!

Learn more about ALL-WEATHER Sinclair JET LUBRICANTS and how they can help in your heavy-duty work. Contact your nearest Sinclair Representative or write Sinclair Refining Company, 600 Fifth Avenue, New York 20, N.Y.

Insure Safety with

SIMPLEX ROOF JACKS and PULLERS in Roof Bolt Installation



For Temporary Support During Installation . . .

Simplex Mine Roof Jacks—Safe, inexpensive, temporary roof support is provided by Simplex Roof Jacks during installation of suspension supports. They eliminate need for costly, time-consuming temporary timbering. Available in 8 and 16 ton capacities with several types of heads and a wide range of heights.

For Testing Load Factor After Roof Bolt Installation . . .

Simplex Re-Mo-Trol Hydraulic Center-Hole Pullers—Check the strength of roof bolt installations with the new Simplex Re-Mo-Trol Hydraulic Pumps and Rams. Re-Mo-Trol with a Center-Hole Ram is the easiest, safest method for testing the load-bearing ability of suspension supports. Tests are made merely by slipping the Re-Mo-Trol Ram over the bolt, which passes through the Center-Hole, and fastening the nut. Smooth, torque-free force is applied by operating the pump unit, and the stress can be read directly in tons from a gauge on the pump. The test is completed in minutes! Re-Mo-Trols are available in 7 models—10 to 100 ton capacities.

Where a self-contained testing unit is desired, the Simplex Center-Hole Jenny is ideal. Six models in capacities from 30 to 100 tons.

For full information, write for Bulletins: HYDRAULIC 51R and MINES 47



THE CENTER-HOLE MAKES IT EASY . . . only Simplex has the Center-Hole



SIMPLEX JACKS—*Standard for Safety —for ALL Mining Jobs*

Simplex LEVER · SCREW · HYDRAULIC Jacks

TEMPLETON, KENLY & CO.

1040 South Central Avenue, Chicago 44, Illinois

Add: New Date for . . . First Mining in America

The first bituminous mining in North America took place in 1720, not 1730, as stated in the August issue of *COAL AGE*, p 108. Moreover, it wasn't in Virginia, as reported, but on Cape Breton Island, Nova Scotia.

These facts came to light in a recent letter from W. N. MacDonald, Sydney, N. S. To back up his letter, Mr. MacDonald quotes the following from a book titled *The Coal Fields and Coal Trade of the Island of Cape Breton*, by Richard Brown: "The first attempt at mining in anything like a regular form was made upon the 10-ft seam on the north side of Cow Bay in 1720."

---

the Westinghouse Electric Corp., at the Centennial of Engineering held in Chicago last month. Mr. Johnson forecast a generating capacity of 160 million kw by 1964, roughly double that of today, and said that in 20 yr capacity will probably exceed 250 million kw.

The Pocahontas Fuel Co. will move its accounting, financial and president's offices to its new office building in Pocahontas, Va., Oct. 1, Armstrong R. Matthews, president, announced Sept. 22. H. R. Hawthorne, chairman of the board, will be located in new offices on the 48th floor of the Chanin Bldg., New York City, on that date. The general sales and export departments will remain in New York, in the new Chanin Bldg. offices.

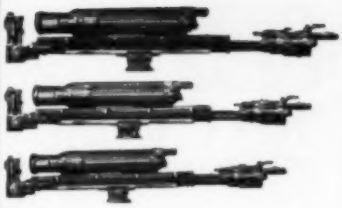
The Philadelphia & Reading Coal & Iron Co. has established a Mineral Industries Research Grant at Pennsylvania State College for study of the manufacture of carbon black and activated carbon from anthracite under processes that will be competitive with present methods. The grant is one phase in a long-range experimental and research program the company is sponsoring and is in addition to the recently announced Fellowship at Mellon Institute in Pittsburgh.

The Federal Coal Mine Safety Board of Review is organized and ready for business, Chairman Alex U. Miller announced last month. Troy L. Back, a former USBM employee from Vicco, Ky., has been appointed executive secretary of the board.

The open fire traditional in Great Britain may become a thing of the past if a committee on national policy for the use of fuel and power has its way. A report by the committee issued last month said that room heaters had an efficiency twice that of the old fashioned open grate and recommended a 100% purchase tax on any appliance below that. Citing large consumption increases unmatched by production improvements as the reason for the present coal shortage, it said Britain will probably have a fuel shortage for years to come and could not expect "help on any substantial scale from nuclear energy" within the next few years.



★ Air-feed sinkers — 2-way feed, 2 sizes. They take the back-breaking work out of drilling horizontal holes, lighten the load on your miners, and increase tonnages.



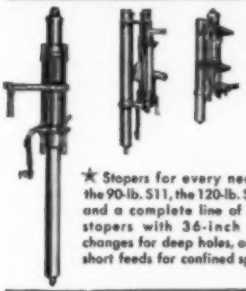
★ Power-feed and hand-cranked drifters. Dependable, powerful, and fast. Ideal for columns and jumbos alike.



★ A complete line of sinkers from 18 to 80 lbs. including the popular 45-lb. H10, and 55-lb. H111.



★ The SDR 34 shaft sinker for faster shaft sinking. Fully closed it's 5'6" between drill centers; open 19'3". All adjustments quickly made with air motor.



★ Stopers for every need — the 90-lb. S11, the 120-lb. SS-22, and a complete line of offset stopers with 36-inch steel changes for deep holes, or with short feeds for confined spaces.

It's Le Roi-CLEVELAND

for

Rock Drills You Can Count On

. . . . . fast-drilling, dependable favorites of mining men since 1906

Of course, you know that Le Roi-CLEVELAND builds the popular, easy-holding H10 and H111 sinkers... the fast-drilling PD24, 25, and 14 power feed drifters . . . the S11 and SS22 stopers with trip rotation for easier handling . . . and a mine jumbo that lets you drill out your rounds faster, with greater safety.

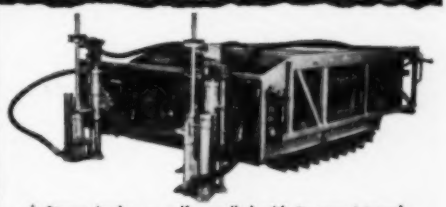
But did you know that Le Roi-CLEVELAND was responsible for some famous "firsts"? Here are a few of them—work-savers that help your miners increase their man-shift production: the air-feed sinker, the offset stoper, the shaft sinker, the stoper jumbo.

So if you have a job of drilling to do—do it with Le Roi-CLEVELAND machines. You can count on them. They're built for speed. And they're built to stay underground, too — where you can use this speed to do more work and cut your costs.

Detailed information about the complete Le Roi-CLEVELAND rock drill line is yours for the asking. Just write us.



★ The famous MDR Jumbo with air-motor poweredbooms for quicker set-ups, greater safety, faster rounds.



★ Stoper jumbo — self-propelled with its own integral dust-collection system for positive dust control, the latest thing for roof bolting.

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CLEVELAND

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RD-30

CLEVELAND ROCK DRILL DIVISION
12500 Berea Road, Cleveland 11, Ohio
Plants: Milwaukee, Cleveland and Greenwich, Ohio

Safety | at low ~~any~~ cost

Safety doesn't have to be expensive. Many operators have found that Armco Liner Plates not only make safer portals, shafts and tunnels but also help keep costs down.

Efficient, corrugated metal design provides ample strength yet keeps weight and bulk down. Corrugations continue through the lapped joints and bolt holes are staggered to assure conduits of uniform strength.

Other advantages include fire-resistance and long, dependable service with little maintenance.

Costs are low because Armco Liner Plates are simple to install. One man can carry, hold and bolt a section into place using only a hand wrench. Less bulk means less excavation, smaller storage space. The wide range of sizes and gages also saves you money. You select exactly what you need to most economically meet your specific requirements.

You'll find Armco Liner Plates ideal for safe, low-cost portals, overcasts, shafts, haulways and relining jobs. Ask someone who has tried them and write for complete information.
Armco Drainage & Metal Products, Inc., 2442 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. Export: The Armco International Corporation.

Armco Liner Plates

ARMCO



John Lewis Joins Coal Age



NO—NOT "THE" JOHN LEWIS! He's pretty busy in Washington these days, reports seem to indicate. Our "John" is John B. Lewis (above), who last month joined *Coal Age's* advertising staff as district manager in New York and New England. He replaces Slade Kennedy, who has been recalled as a dive-bomber pilot for a second hitch in Marine Aviation. Mr. Lewis, who attended Oberlin College, had 5-yr Navy service during World War II and has just returned to the McGraw-Hill organization after another 1½-yr of active duty. We thought you'd like to meet him, in case you'd heard the rumor that John had joined *Coal Age*.

Coal retailers active in Coal Heating Service have been supplied by the CHS Div. of the National Coal Association with advertising and publicity material for use in special newspaper promotions to launch the new heating season. Included are special newspaper articles and suggested advertising copy promoting early coal buying and retailer services. The CHS Div. also recently released its 1952-53 book containing 62 advertisements available free in mat form.

Association Activities

Moshannon Institute Holds 30th Anniversary Celebration

Almost 800 members and guests of the Moshannon Coal Mining Institute were present at the Institute's 30th anniversary celebration held Sept. 18 in Altoona, Pa. At the meeting, John B. Helman, superintendent, Imperial Coal Corp., Coalport, was elected president, succeeding James W. George, vice president and general manager, Rockhill Coal Co. Robert T. Laing, executive secretary, Central Pennsylvania Coal Producers' Association, served as toastmaster and was the principal speaker in the absence of Richard Maize, Secretary of Mines, who was unable to attend.

in shuttle car cable

there are no "lucky" breaks

-they all cost money!



. . . and four or five breaks can equal the cost of the cable in lost production. Since actual records show different makes have widely varying life expectancy, it pays to choose your cable carefully.



for longer "break-free" service insist on



Cold Rubber Insulated **Securityflex**

This ANACONDA portable power cable—the first with cold rubber insulation—won't override, kink or twist. New or aged, it has greater resistance to cutting, crushing, impact, abrasion, heat and moisture penetration than other types. It stands up well under reel tension, passes easily over guides, and won't fatigue readily from frequent sharp bends. Patented "anti-short" breaker strip and flat-stranded grounding wire make it the safest known cable for the job.

When cable repairs skyrocket costs so fast, it's poor economy to buy less than the best. A sample length of Securityflex* Shuttle Car Cable will convince you that this super-safe, super-tough cable can speed your production and cut down those "bad" breaks that leave your men and machinery idle too long. Call your nearest Anaconda Sales Office or Distributor. Anaconda Wire & Cable Company, 25 Broadway, New York 4, New York.

*Reg. U.S. Pat. Off.

the right cable for the job ANACONDA® **wire and cable**

there is NO substitute . . .



MPC WOOD-LINED PIPE MEETS ALL THE REQUIREMENTS FOR A DEPENDABLE MINE PIPE

COMBINES THE STRENGTH OF STEEL WITH THE DURABILITY OF WOOD

MPC Wood-Lined Steel pipe is ideally suited for acid mine waters, culm, and slurries to pressures up to 400 psi. The wood lining, made of clear redwood, Douglas fir, or pine staves, is offered in thicknesses from 11/16" through 3", while the outer carbon steel shell is available from 14 gauge through schedule 80 thickness. Flanges, welded to the pipe, carry ratings of 125 lb. upwards, with A.S.M.E. bolt circle or special drilling. Pipe sections 10' and 20' regular lengths or fabricated to suit. Internal diameters 4" through 48". Pipe exteriors protected against corrosion. Wood-lined fittings available for all diameters in standard and special designs.

Get in touch with your MPC representative or write Dept. CA.

EST 1899 mpc MICHIGAN PIPE COMPANY

COAL MEN ON THE JOB . . .



Bell & Zoller Coal & Mining Co.
West Kentucky Div., Madisonville, Ky.

NATHANIEL NAPIER (standing left) and Oscar Winders, section foremen; Oswald Prince, mine foreman. Kneeling James Daves (left), James E. Scott, J. C. Gunn and Guy Knight, section foremen.





Gulf Smokeless Coal Co., Tams, W. Va.

TOP PHOTO: Nelson Scarbro (seated, left) and H. E. Lytton, section foremen; C. E. Craven, chief inside electrician; N. T Dowell (standing, left), M. F. Damron and R. G. Hamm, section foremen.

LOWER PHOTO: Byron Udy (seated, left), Jack Tolley, W. E. Parker and Harold Hill, section foremen; Ivan Thompson (standing, left), assistant engineer; George D. Williams, head night foreman; W. E. Greer, section foreman; and J. B. Bower, head electrician

One of a Kind Beats Pair in Alabama



BACKFILLIN' BRUTE. F. M. Carmichael uses this TD-24 to doze spoil piles back into worked-out trenches at his Alabama mine. It's the most powerful crawler on the market, the work-champ of the world.

International TD-24 replaces two other crawlers, cuts costs 25% for Carmichael

F. M. Carmichael is a successful strip mine operator at Jasper, Alabama, because he makes maximum use of mechanization to keep manpower and operating costs at a minimum.

This Alabaman cut his mining costs to rock bottom when he got one Big Red International TD-24 to replace two less powerful crawlers. Here's his story: *"My TD-24's tremendous power and speed make this a one-tractor job and cut my dirt moving costs 25%. And for low cost operation there's just nothing that compares with Internationals."*

Call in your International Industrial Distributor, the man who really services what he sells, and find out why International is the "Power that Pays" through increased production with minimum maintenance.

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILL.

INTERNATIONAL

INTERNATIONAL HARVESTER

SEE YOU AT THE POLLS!

POWER THAT PAYS



Send inquiries to either Köln, Germany or Ulm, Germany

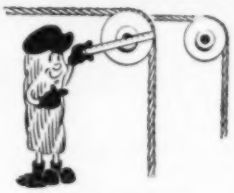
Shovel and Dragline Operators

do you want to cut operating costs?

J&L STEEL

Here are a few tips on longer Wire Rope Service Life!





Avoid Small Drums and Sheaves



Keep Lines from Rubbing



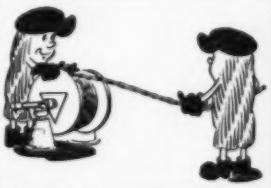
Keep Drums and Sheaves Aligned



Check Your Sheave and Drum Grooves



Lubricate Your Lines Regularly



Use Jacks When Transferring Lines from Reel to Drum

SPECIFY J&L WIRE ROPES FOR YOUR EQUIPMENT

Proof of the value of any wire rope lies in its performance on the job. The unexcelled performance record of J&L Wire Ropes can be traced to J&L's *quality control* method of manufacture. *Quality control* that ensures the finest finished product by regulating every step in the manufacture of wire rope from the mining of iron ore to final stranding and closing operations. The result is wire rope that provides maximum service life—helps keep your operating costs to a minimum by cutting down time for re-rigging and making possible maximum production per wire rope dollar.

If you're not already using J&L wire rope, why not contact your nearest J&L representative *today*.

JONES & LAUGHLIN STEEL CORPORATION
PITTSBURGH 30, PA.

Wellman will build it

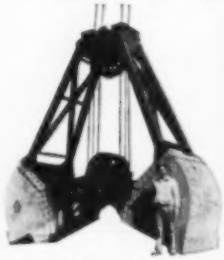
Special Cranes
Ore Bridges
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Charging Machines
Forging Manipulators
Car Dumpers
Gas Flue Systems
Gas Reversing Valves
Coke Pushers
Mine Hoists
Skip Hoists
Clamshell Buckets

Wellman ore and coal handling bridges

give fast and efficient operation



One of two 6-ton Coal Handling Bridges in this installation.



6-ton Wellman Williams Type Coal Bucket used with these bridges.

● Take advantage of Wellman's long experience in designing and building handling bridges of many types and capacities. Your selection from the complete line will provide fast and efficient handling of coal or ore. Wellman equipment, in service the world over, is recognized for its long life and dependable service. It is backed by more than half a century of engineering experience.

THE WELLMAN ENGINEERING COMPANY

7000 CENTRAL AVENUE • CLEVELAND 4, OHIO

SAVE METAL! CUT YOUR MAINTENANCE COSTS ABOVE GROUND AND BELOW!

STOP RUST! with RUST-OLEUM

May be applied directly over rusted surfaces without removing all the rust!

So Easy To Use That One Man Often Does The Work of Two

Indoors and out, above ground and below—RUST-OLEUM stops rust on your pipes, cars, metal sash, tipples, machinery and surface equipment! Saves time, labor, and money because RUST-OLEUM may be applied directly over rusted surfaces after wirebrushing and scraping to remove rust scale and loose particles. Cuts maintenance costs, too, because RUST-OLEUM *lasts longer* applied over surfaces already rusted. Resists fumes, dust, moisture, rain, snow, and weathering. Beautifies as it protects in all colors, aluminum, and white. Get the facts, today. Prompt delivery from Industrial Distributors in all principal cities, United States and Canada.

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2464 Oakton Street • Evanston, Illinois

Available in all colors, Aluminum and White







Look for this label — be sure it's genuine RUST-OLEUM

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MAIL TO: RUST-OLEUM CORPORATION
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- ☐ Have a Qualified Representative Call
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Track to Trackless Economy for LESS...

"Trackless Mining" with conventional cutters, loaders and shuttle cars is recognized by operators throughout the United States as the most economical and efficient mining system that has yet been completely developed for present day coal mining operations.



CONVERTED GOODMAN 460 OR 260 LOADER

CONVERTED LOADING MACHINES

"Lee-Norse Conversions" thoroughly tested and proved during the past decade offer you the opportunity to go "Trackless" now by converting your present track cutters and loaders at much less cost than investing in new mining machines.



CONVERTED GOODMAN 324 CUTTER



CONVERTED JEFFREY 29U CUTTER

CONVERTED CUTTING MACHINES

Before you buy new machines, investigate the advantages "Lee-Norse Conversions" offer you, namely:

1. Lower investment compared with new mining machines.
2. Very little increase in spare parts inventory.
3. Converted machines well known to your operators and maintenance men. No need for re-education.
4. No time lost during change-over. Conversions take less than 30 days.
5. Obsolescence losses due to possible new continuous miner development held to a minimum.

It's Smart to Convert

Lee-Norse Company

CHARLEROI, PA.

LEWIS GAINS . . . from p 128

tained no provision covering that problem.

3. Will the Wage Stabilization Board authorize the increase?

Formally, WSB yardsticks permit a 10% boost in average hourly wage rates over January, 1950, plus a boost comparable to the rise in the cost of living. Those two factors total 15.9%. The new contract breaks through that ceiling by some 4.5 percentage points. But WSB may relate the miners' boost to the recent steel increase or it may argue that the miners have had no increase for 20 mo. In any event, WSB may be expected to find a way to approve the increase.

Leads From Weakness

At the outset, nearly everybody agreed that Mr. Lewis' position was the weakest ever. These things stood in his way:

1. Bituminous stockpiles stood well over 80,000,000 tons. Though individual stockpiles varied, most industries had enough to last 45 to 90 days.
2. Non-union tonnage adds up to a good deal, and is growing. A long strike might be the very thing to make it grow faster.
3. Lots of miners were on shortened production schedules. They wouldn't welcome a complete stoppage of wages.
4. A strike would dry up the flow of money to the welfare till.
5. Coal miners still were far out front of the wage parade—well ahead of steelworkers even after Phillip Murray won his big package.
6. Public anger, barely settled since the steel strike, doubtless would flare up again if coal miners brought steel mills to a halt.
7. Mr. Lewis still wants repeal of the Taft-Hartley Act. Provoking Congress with a coal strike would hinder rather than help this cause and might result in a ban on industry-wide bargaining.

The question: Could Mr. Lewis map a strategy that would turn weakness into strength?

The answer: he did.

Strategy Emerges

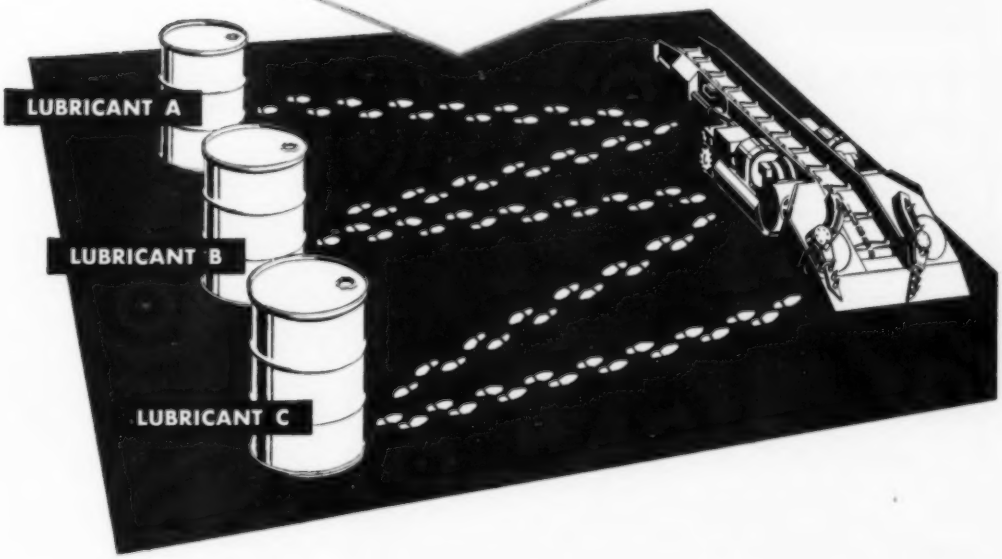
Like a canny field general, Mr. Lewis probed for soft spots in the opposition, narrowed down the battle fronts, drove his salients where gains were easiest to make and then consolidated his advances.

Probe for Weak Spots

Anthracite and welfare—Feeling out anthracite, Mr. Lewis attacked on the welfare line. The anthracite fund has been tottering for a long time. Tonnage royalties are low because anthracite productivity is low. Anthracite miners have had few of the choice pickings their bituminous brothers have enjoyed.

Anthracite producers therefore doubtless expected to give ground on welfare. In fact, it's said they offered 15c per ton early in their talks with Mr. Lewis. Finally, they went along with Mr. Lewis' request for 20c, reportedly in exchange for his promise that wages soon would

How much are these extra steps costing YOU?



GULF MINING MACHINE LUBRICANT does the job of 2 or 3 other lubricants

—and does it better

Here's effective help in your efforts to reduce maintenance costs and simplify lubricant storage and handling —from oil house to face.

With Gulf Mining Machine Lubricant you eliminate confusion at the face, prevent application mistakes, and insure better protection for lubricated parts.

For additional information on this top quality product, write, wire, or phone your nearest Gulf office.

GULF INDUSTRIAL LUBRICATION

GULF OIL CORPORATION
GULF REFINING COMPANY
Pittsburgh 30, Pa.



COMMERCIAL STEEL BEAMS

Commercial Steel Beams are ideal for mine entry roof supports not only due to their ease of installation, but because of the safety they afford workmen during and after being erected . . . For safe, permanent roof supports specify Commercial Steel Beams . . . Commercial Supports are available in every size and radii for every job.

THE COMMERCIAL SHEARING AND STAMPING CO.
Youngstown 1, Ohio

What the New Contract Costs

Mr. Lewis says:

"The American coal operators never would have mechanized their mines and increased per-man-day productivity unless they were compelled to do so by the pressure of the organization of the mineworkers . . . We want participation. We ask for it. We ask for it before the operator gets it, thus to compel him to modernize. Otherwise, he wouldn't move . . .

"Fifty years ago in Ohio . . . the wages of the miners were very low and their conditions very hard . . . All right, in 50 years their wages have advanced 1,700%. The price of coal in the same era has advanced 40%, f o b the mine . . .

"Some pseudo-economists say it's useless to raise wages because the cost of living immediately eats it up. That is just not true in America . . .

"The UMW are not taking money out of the public pocketbook . . . They are taking it out of the productivity and the new values that they help to create. If under our system of free enterprise there are too many free riders who climb on the anthracite ton and put the bite on it after it leaves the colliery, that's our fault and we're not going hungry because of that fact."

be switched from a tonnage basis to a day basis. With 20c in his pocket for anthracite welfare, Mr. Lewis could make 10c look small to bituminous operators. Anthracite negotiators agreed further to accept whatever wage increase Mr. Lewis might wrest from Mr. Moses or Mr. Moody.

BCOA and wages—On the wage front, BCOA was the weak spot. Commercial operators in that organization probably have made a little more money than Southern operators and may be able to swallow a substantial wage boost without gagging. Besides, steel carries a lot of weight in BCOA. Only recently, steel ended a long strike by giving steelworkers a 21c package. Could steel do less for coal miners? Besides, could steel risk another mill shutdown public-relations-wise? The answer to both questions was "No." In addition, what difference does 50c or 60c per ton of coal make against steel selling for $80 to $110 per ton? Not much.

All that explains why Mr. Lewis trained his big guns on BCOA. He fixed contract-termination dates to bring BCOA under threat of a strike 10 days ahead of the Southern group. He set a strike date for Sept. 20 but exempted non-BCOA operators west of Ohio, plus anthracite. Like anthracite producers, Midwest and Western operators agreed to accept whatever Mr. Lewis could get from others.

The plot was clear: Threat of a piecemeal strike would cover Mr. Lewis' own weaknesses. Anthracite, Midwest and Western groups would keep on produc-

MAINTENANCE COSTS GO DOWN...

when you repair DRAGLINE BUCKETS WITH MANGANAL

U.S. Patents 1,876,788-1,947,167-2,021,945

11% -13½% Manganese-Nickel Steel



- MANGANAL is the toughest metal known not harmed by heat.
- Workhardens under impact and abrasion to 550 Brinell.
- Tensile strength to 150,000 p.s.i.
- Dragline buckets repaired with MANGANAL usually outlast new ones.
- For greatest strength attach with MANGANAL Bare or Special Tite-Kote Electrodes.



FREE
Literature on latest methods for speedy and economical repair of worn equipment.
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Reliable EQUIPMENT IS AS VITAL TO THE COAL INDUSTRY AS COAL ITSELF...

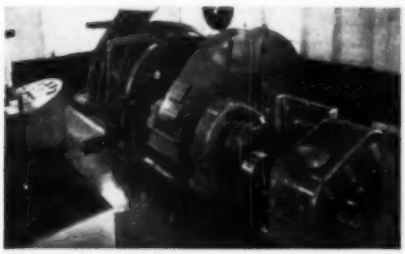
HOLMES MINING EQUIPMENT

The hundreds of mines using equipment engineered and built by Holmes, is a testimonial that they have been *doing one thing well* since 1872. Use this specialized experience to obtain the most advanced design, the best of materials and the latest methods of manufacture. Take advantage of this background of creative engineering and long-standing reputation for sturdy construction that assures efficient, dependable performance at lower over-all costs. Call a Holmes Mine Equipment engineer for consultation in the planning and development of your requirements. There is no obligation.

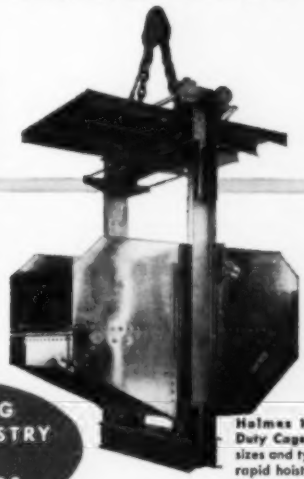
ROBERT HOLMES & BROS., INC.
DANVILLE, ILLINOIS



Holmes Lowering Spirals gently lower and deposit materials on the peak of the pile in bulk storage bins, eliminating degradation. Write for complete information.

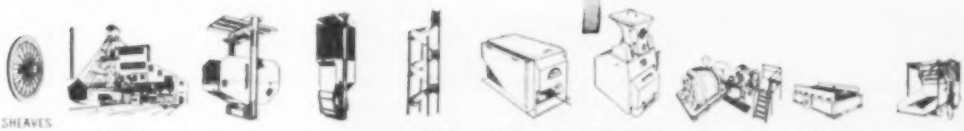


Advance Design Hoists feature the latest and most complete control equipment. Ask for complete information.



Holmes Heavy-Duty Cages in all sizes and types for rapid hoisting and low maintenance. Ask for complete information.

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What the New Contract Costs

How Mr. Moody Sees It

Soft coal can't afford an expensive contract now. Here's why:

1. The southern fields are operating either on an extremely thin margin or at a loss. Producers in District 8 have lost money each month since April. Average losses in June were 18c a ton; July, 14c. District 7 producers averaged 26c loss in June, 22c in July.

2. Competition is serious. Fuel oil was cut 35c a barrel in the last 60 days—equal to $1.50 a ton for coal. A price boost now would be economic hari-kari. Soft-coal producers sold 145,000,000 tons to railroads in 1945. This year, we'll be lucky to sell 45,000,000. In 1945, soft coal had a domestic market of 130,000,000 tons. This year, we don't expect to reach the 70,000,000 tons sold last year.

Mr. Lewis knows these problems bettter than any other single man in the industry. We have talked "soberly and grimly" about them.

Yet the "suggestion" Mr. Lewis made for terms in the new contract would cost coal producers 60c a ton. Many coal producers just couldn't pay for it.

---

ing while he squeezed where the squeeze would hurt most—the industrial East. That way, there'd be enough coal to go around, though on reduced rations, and there'd be no loud public howl. Also, a substantial number of miners would keep on working. Though welfare collections would shrink, they wouldn't dry up altogether. With a smaller area to control, Mr. Lewis could hold a tighter rein on non-union activities. And as long as the strike wasn't total, Congress doubtless would stay quiet about Taft-Hartley and industry-wide bargaining.

Drive Your Salients

Though Mr. Lewis talked frequently with Mr. Moody (Mr. Moody says some seven or eight times, during which some 23 issues were discussed), he directed his main attack at Mr. Moses and BCOA.

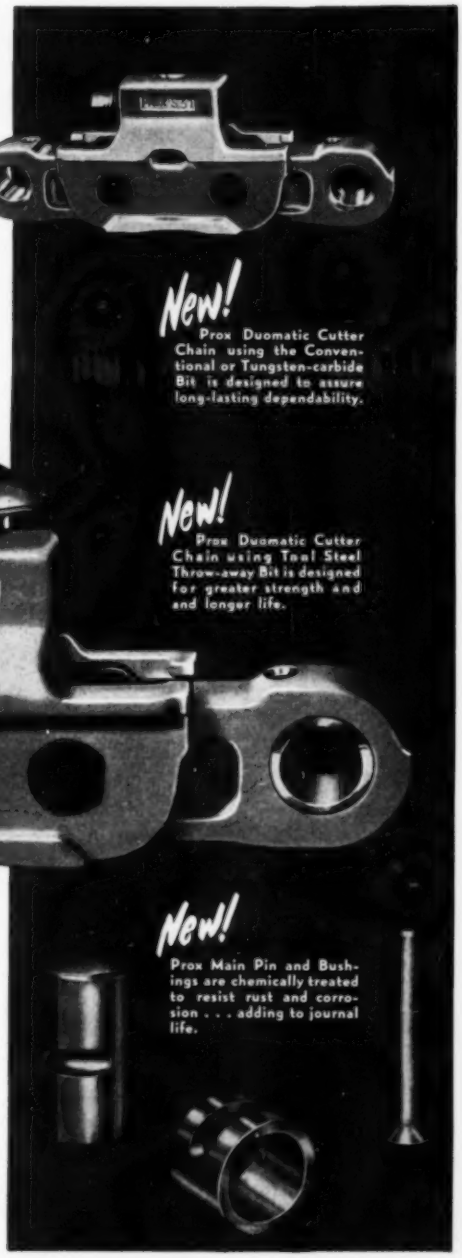
For his part, Mr. Moses is reported to have decided that his group wasn't going to take a strike while others worked. He knew he had to give some increase. He looked at what his group was willing to give and what it would take to avoid a strike, and then decided that the difference wasn't worth the cost of a strike.

First, Mr. Lewis held out for a 7-hr day and $1.75 daily increase. Then he asked for a 7¾-hr day and $1.80. Mr. Moses took this latter proposal to Pittsburgh early in the week of Sept. 8. There, his directors voted to reject the proposal, objecting principally to the cut in hours. Thereupon Mr. Lewis gave up his 15 min and asked for $2 instead. He and Mr. Moses compromised on $1.90.

Mr. Moses points out that 15 min off the working day would have cost 56c a day and that operators thus saved 46c by

New! ... and ready to outperform all others!

PROX DUOMATIC CUTTER CHAINS and TOOL STEEL BITS



New! Prox Duomatic Cutter Chain using the Conventional or Tungsten-carbide Bit is designed to assure long-lasting dependability.

New! Prox Duomatic Cutter Chain using Tool Steel Throw-away Bit is designed for greater strength and and longer life.

New! Prox Main Pin and Bushings are chemically treated to resist rust and corrosion . . . adding to journal life.

PROX, producers of America's finest coal cutting equipment, introduces its newest chain ... designed with the newest features and improvements! New chemically treated pins and bushings resist rust and corrosion ... add to journal life! Expert engineering keeps the entire chain rolling smoothly, helps to eliminate dust. New pin design shortens assembly time and provides for faster-on-the-job repair and replacement!

PROX

FRANK PROX COMPANY, INC. TERRE HAUTE INDIANA

Consult your nearest PROX SALES REPRESENTATIVE for complete information

P. L. JOHNSON, 519 East Main St., Hazard, Ky.

RUBY A. THOMPSON, Hotel Madison, Madisonville, Ky.

Y. E. FOSTER, P. O. Box 583, Uniontown, Pa.

CHARLESTON ELECTRICAL SUPPLY CO., Charleston, West Virginia.

CAMBRIDGE MACHINE & SUPPLY CO., Cambridge, Ohio.

WESTERN SALES ENGINEERING CO., 375 So. West Temple, Salt Lake City (1), Utah.

CHARLES J. FORBES, Frank Prox Co., Inc., Terre Haute, Ind.

trading 15 min against the difference between $1.80 and $1.90. He denies that steel companies forced the deal. He says that only 20% of BCOA production is "captive" tonnage and that the steel companies, as well as Pittsburgh Consolidation Coal Co., stayed in the background to avert any charge that they influenced the agreement.

Mr. Lewis wanted to re-insert the "able and willing" clause, abandoned in 1950, or one absolving UMWA of responsibility for unauthorized strikes. As written, the new contract implies that operators will not sue under Taft-Hartley.

Mr. Moses held about 25 meetings with Mr. Lewis, all "secret." No operator dealt with Mr. Lewis—only Mr. Moses. Meetings were held sometimes in one office, sometimes in another, at the Carlton Hotel, or elsewhere.

During the course of negotiations, talks proceeded on a quiet, friendly basis, according to reports. Only one incident ruffled smooth relations. When Mr. Moses took Mr. Lewis' first proposal to Pittsburgh, Mr. Lewis apparently thought he had an agreement. Accordingly, he called his Policy Committee to Washington for a meeting Sept. 15, presumably to ratify the tentative agreement. When BCOA directors turned down the proposal, Mr. Lewis was disappointed, to say the least.

At a press conference Sept. 15, following the meeting of the 200-man Policy Committee, Mr. Lewis, saying that he had had a tentative agreement with Mr. Moses (Mr. Moses denied that there had been an agreement) and that the agreement had been withdrawn, announced his strike plans and said that the only way to avert a strike was for Mr. Moses and Mr. Moody to agree to the terms of the tentative agreement or its equivalent.

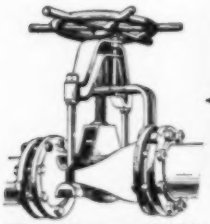
Mr. Lewis also took the press conference as an opportunity to deny that a three-day week with a penalty wage clause for work beyond the third day ever had been a suggestion or proposal of the UMWA. He suggested that newspaper reports of such demands had originated with certain operators who had not identified themselves but who had most to gain by a uniform work week within the industry. He said that if such operators would come forward and make their proposals, he would talk about them, but he would not make their proposals for them.

Five days later, Sept. 20, Mr. Lewis and Mr. Moses jointly announced the new agreement.

Consolidate Your Gains

With BCOA in the bag, the only task remaining for Mr. Lewis was to fill in the blanks in the surrender papers signed earlier by Midwest, Western and anthracite producers. That Mr. Lewis did. Except for the Southern group, who had the unhappy choice of capitulation or shutdown, Mr. Lewis' victory was complete. How long the Southerners could survive the pressure was problematical.

As for getting WSB to authorize the wage increase, Mr. Moses says, "That's Mr. Lewis' job." However, since a union alone cannot ask WSB approval, BCOA doubtless will join in the petition when it is ready and if BCOA can endorse the grounds for the union's plea. It may be 2 mo before WSB can reach a decision. The 10¢ boost in welfare levies does not require WSB approval unless benefits are to be increased. UMWA sources say there are no present plans to increase benefits.



Rubber Pinch Valves for Abrasive Pulps and Corrosive Liquids

Patented "hinged" Rubber Sleeve

Recesses molded into sides of sleeve act as "hinges" during compression, eliminating excessive strain and wear. These valves have been used successfuly for many years by various industries, wherever there is a problem of transporting abrasive or corrosive pulps or liquids. Here are some of the other proved advantages of these valves:

- Long Life Under Severe Conditions
- Unobstructed Flow Passage
- Positive Closure on Solids
- No Working Parts in Contact with Pulps or Liquids
- Only ONE Wearing Part
- Withstands All Chemicals Not Harmful to Rubber or Neoprene
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New free **CATALOG** gives complete information on Massco-Grigsby Rubber Pinch Valves; Marcy grinding mills for laboratory, pilot plant and commercial grinding; laboratory crushers and pulverizers.

The Mine & Smelter Supply Co.

Box 5270, Terminal Annex, Denver, Colo., U.S.A.
Offices in Salt Lake City, El Paso, 1775 Broadway, N.Y.C.



Yes-feed by weight

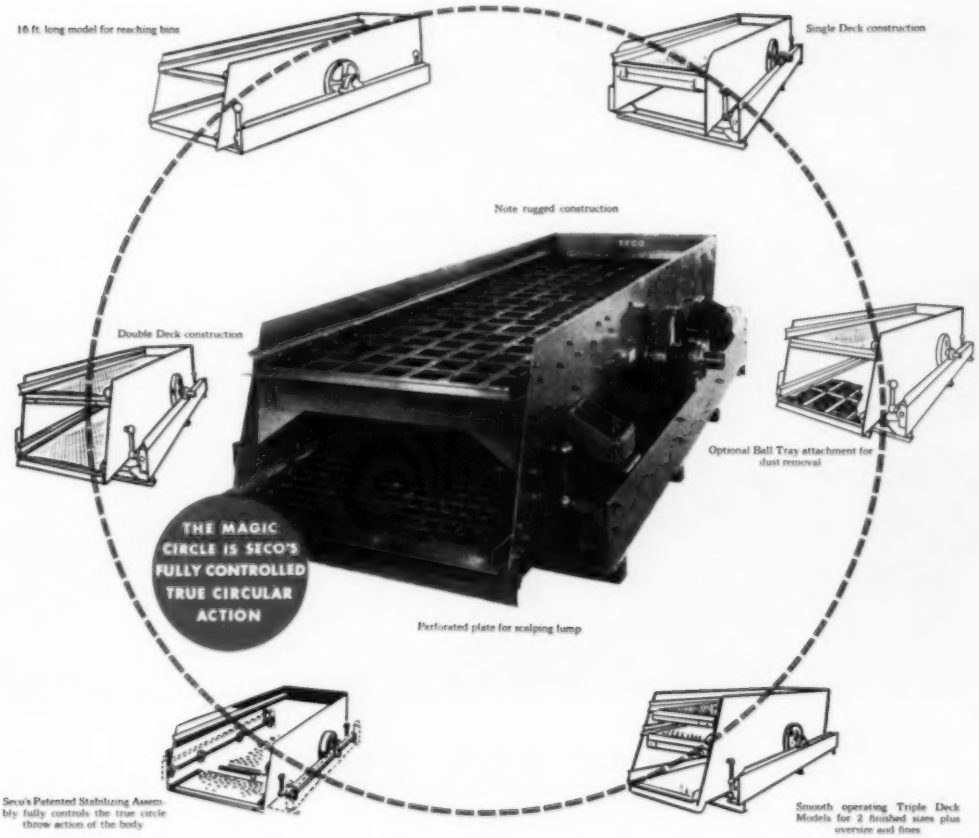
with the MERRICK FEEDOWEIGHT, a self-contained automatic conveyor scale, with automatic gate for feed rate control. Powered feed regulator operates gate, without restraint on scale beam. Uniformly feeds bulk material BY WEIGHT; automatically totalizes weight of materials fed. Simple to operate. Slow moving parts mean long life. Easy to install, maintain.

Manufacturers of

The Merrick WEIGHTOMETER, which weighs any material carried on a belt conveyor without interrupting conveying operation. Complete descriptive matter on request.

MERRICK SCALE MFG. CO.
Engineers and Mfrs. of Automatic Weighing Equipment
PASSAIC, N. J.

HERE'S THE "*MAGIC CIRCLE*" FOR CLEAN COAL IN THE WANTED SIZES



Hundreds of Coal Operators Attest to the Accuracy and Dependability of Seco Vibrating Screens

Today, screening R. O. M. into sizes to meet the market's demands, is no longer considered an extra cost of operation, *but* a sound business practice that actually *ups* profits for progressive operators. That's where Seco screening equipment fits into the modern coal preparation picture. The proved smooth operation and long life of dependable Seco vibrating screens are paying off in more profits per ton for hundreds of operators.

Are you in the "magic circle"? If not, why lose dollars waiting . . . Get the facts on Seco low cost per ton cleaning and sizing today! Write for new Coal Bulletin #41.

SECO
TRUE CIRCULAR ACTION
VIBRATING SCREENS

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EVERY LOT TESTED

Here are some of the samples of explosives taken daily at one Hercules plant. Every day, at every plant, samples of each lot are analyzed and tested for conformity with Hercules' strict chemical and physical standards.

Sensitivity, consistency, water resistance, moisture content, density, percentages of various ingredients . . . these are some of the exacting laboratory inspection standards that must be met.

From raw materials to packaged products, Hercules' progress in explosives assures better blasting performance and helps to lower blasting costs.

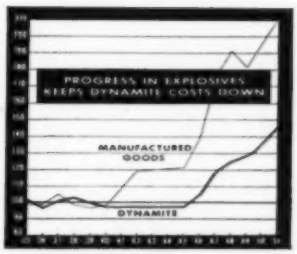


Chart shows relative stability of dynamite prices since 1935, as compared with prices of other manufactured goods. 1935-39 values=100.

HERCULES POWDER COMPANY

INCORPORATED

Explosives Department, 936 King St., Wilmington 99, Del.

KR52-6

Let these
plain hard facts show
you how you'll save
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CHEVROLET
Advance-Design
TRUCKS

CHEVROLET **first** in demand
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Fact No. 1

THEY LIST FOR LESS

Yes, Chevrolet trucks *list for less* than any other comparable truck capable of handling the same payloads. And yet, in a Chevrolet you'll find a combination of great truck features you can get in no other truck.

Fact No. 2

EVERY MILE AN ECONOMICAL MILE

For low fuel, oil and upkeep costs you can't beat Chevrolet's time-proved Valve-in-Head engines. Thriftmaster or Loadmaster, these engines give you top economy and long life to match the ruggedness of frame, axles and other units.

Fact No. 3

THERE'S ONE TO FIT YOUR JOB

Right down to wheels and tires, every Chevrolet truck is fitted to the job it has to do—*factory-matched* to operating conditions and payload. You don't have to waste money on "too much truck" or sacrifice efficiency with "too little truck" for your needs.

Fact No. 4

VALUE STAYS HIGHER LONGER

Chevrolet trucks traditionally bring more dollars at resale or trade-in than other makes costing about the same when new. You get more value with Chevrolet trucks from first to last. See your Chevrolet dealer.

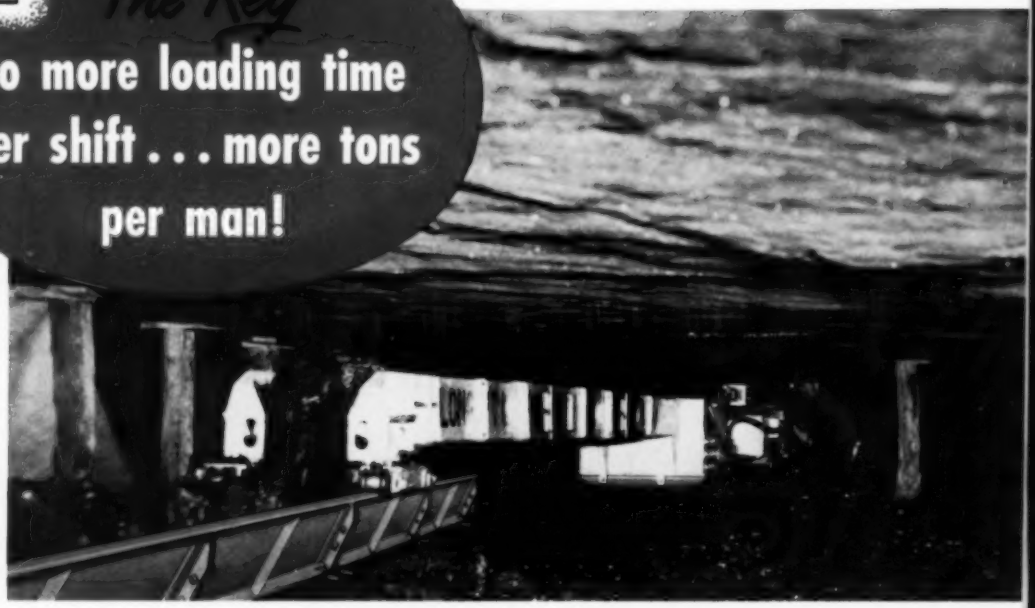
CHEVROLET ADVANCE-DESIGN TRUCK FEATURES

TWO GREAT VALVE-IN-HEAD ENGINES—Loadmaster or the Thriftmaster—to give you greater power per gallon, lower cost per load • **POWER-JET CARBURETOR**—for smooth, quick acceleration response • **DIAPHRAGM SPRING CLUTCH**—for easy-action engagement • **SYNCHRO-MESH TRANSMISSION**—for fast, smooth shifting • **HYPOID REAR AXLE**—for dependability and long life • **TORQUE-ACTION BRAKES**—on light-duty models • **PROVED DEPENDABLE DOUBLE-ARTICULATED BRAKES**—on medium-duty models • **TWIN-ACTION REAR BRAKES**—on heavy-duty models • **DUAL-SHOE PARKING BRAKE**—for greater holding ability on heavy-duty models • **CAB SEAT**—with double-deck springs for complete riding comfort • **VENTI-PANES**—for improved cab ventilation • **WIDE-BASE WHEELS**—for increased tire mileage • **BALL-TYPE STEERING**—for easier handling • **UNIT-DESIGNED BODIES**—for greater load protection • **ADVANCE-DESIGN STYLING**—for increased comfort and modern appearance.

CHEVROLET DIVISION OF GENERAL MOTORS, DETROIT 2, MICHIGAN

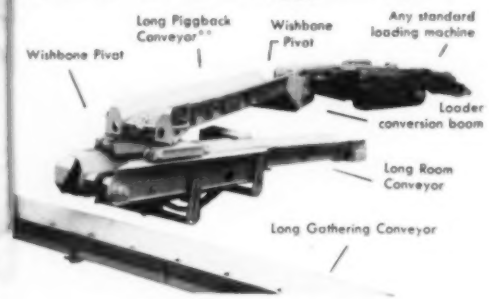


The Key to more loading time per shift . . . more tons per man!



The Revolutionary LONG PIGGYBACK* . . . the first and only bridge conveyor—assures increased production with any standard loader or continuous miner.

Units of the LONG Piggyback System



The two "Wishbone" pivots—one at each end of the Piggyback—provide a pivot action of 180° each. This means the load is centered at all times and continuous haulage can be maintained at a 90° angle breakthrough and in close quarters. The dolly action permits long advances without pan-ups.

**Patented and patents pending

In mine after mine, under a wide range of operating conditions, the Piggyback System has proved to be the most efficient, economical solution to the problem of true continuous mining.

Serving as a connecting bridge between the loader and room conveyor, the Piggyback takes coal out in a steady, continuous, controlled flow *as fast as it is produced*. Your loaders are kept busy, with no "down-time" waiting for intermittent transportation.

In operation, the loader-Piggyback-Long Room Conveyor combination works as a single unit. The receiving end of the Piggyback is attached directly to the loading machine and follows it automatically as it moves. That means the operator can devote his time exclusively to keeping the loader in coal. He never has to tram coal on the loader or stop for pan-ups.

In addition to its many other advantages, the Piggyback System is economical to install and offers substantial maintenance savings.

Long Piggyback Conveyors are available in two models with rated capacities from 2 to 5 tons per minute.

Write for details or demonstration

Long Super Mine Car Co., Inc. • Oak Hill, West Virginia

LONG PIGGYBACK®
CONTINUOUS HAULAGE MINING

*Trade Mark

every other MARION 151-M on the IRON RANGE is a REPEAT ORDER



A NOTABLE RECORD OF ACCEPTANCE

Many of the biggest companies on the Iron Range are owners of MARION 151-M shovels.

MORE THAN HALF of these MARION owners have two or more 151-M machines.

In these days of urgent demand for increased ore production —days of high operating costs—days in which it is perhaps more important than ever to make wise selections of equipment, MARION is humbly proud of this unusual record of acceptance.

Let your nearest MARION representative show you the facts and figures about the jobs the MARION 151-M is doing on the range.

MARION POWER SHOVEL CO.
MARION, OHIO, U. S. A.

OFFICES AND WAREHOUSES IN ALL PRINCIPAL CITIES

from 3/4 cu. yd. to 45 cu. yds.



Virginia Safety Meet Draws Large Crowd

SCENE at the first aid meet held in Big Stone Gap, Va., Aug. 30, under the sponsorship of the Big Stone Gap Chamber of Commerce in cooperation with the USBM, the State Division of Mines, the UMWA and the Virginia Coal Operators' Association. Participating in the meet were six teams, all from mines of the Stonega Coke & Coal Co., and Girl Scout and Boy Scout teams from that company's Roda colliery. Prizes for the teams ranged from $35 to $100, in addition to trophies presented by the Virgina Operators' Association, The UMWA, Mine Safety Appliances Co. and Stonega Coke & Coal. Winner of the meet was Glenbrook colliery, captained by McLynn Sharpe.

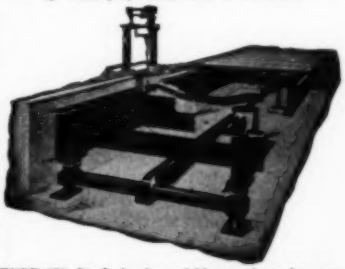
WINSLOW

Dependable — Accurate

TRUCK and TRACTOR TRAILER SCALES



TYPE "C. S." *Portable Scale*—easily and quickly set up—with preparation held to minimum



TYPE "S" *Pit Scale*—for weighing trucks and tractor trailers—Platform lengths 18 ft. to 60 ft. inclusive.

WINSLOW SCALE COMPANY

TERRE HAUTE 1, INDIANA

Scale Manufacturers since 1896

PERSONALS . . . from p 130

River Lumber Co., Welch, W. Va., has joined the U. S. Steel Co., Gary, W. Va., as a senior engineer. He formerly was associated with the Peerless Coal & Coke Co., Vivian, W. Va.,

Charles A. Barrett, assistant general foreman, Helen No. 9 mine, Eastern Gas & Fuel Associates, Helen, W. Va., has been promoted to general mine foreman, replacing **J. T. Craddock,** who has assumed other duties in the C.C.B. Division. **Virgil Elkins,** section foreman at Stotesbury No. 11, succeeds Mr. Barrett. **C. F. Wilcox,** chief electrician, Sonman mine, Portage, Pa., has been transferred to Federal No. 1, Grant Town, W. Va., in the same capacity, replacing **C. E. Zuspan,** who recently retired. **Arthur L. Tyger,** maintenance foreman, succeeds Mr. Wilcox at Sonman.

George H. Love, president, Pittsburgh Consolidation Coal Co., Inc., Pittsburgh, has been elected a member of the board of Union Carbide and Carbon Corp.

Lute J. Parkinson, mining engineer, has been named head of the mining department of the Colorado School of Mines, Golden, Colo., succeeding **Clifton W. Livingston,** who has resigned to form his own mining company. Mr. Parkinson, who has had world-wide mining experience, was recipient of the School of Mines' distinguished achievement award in 1950.

OBITUARIES . . . from p 130

since 1945, died Aug. 12, while conducting a routine inspection at No. 9 mine, Northwestern Improvement Co., Roslyn, Wash. Beginning his mining career in South Wales at the age of 12 as apprentice miner, he attended British Science and Art School of Mines and in 1904,

Memo from office of:
GENERAL SUPERINTENDENT

Why haven't we investigated the swing to the hydraulic barney car-spotter?*

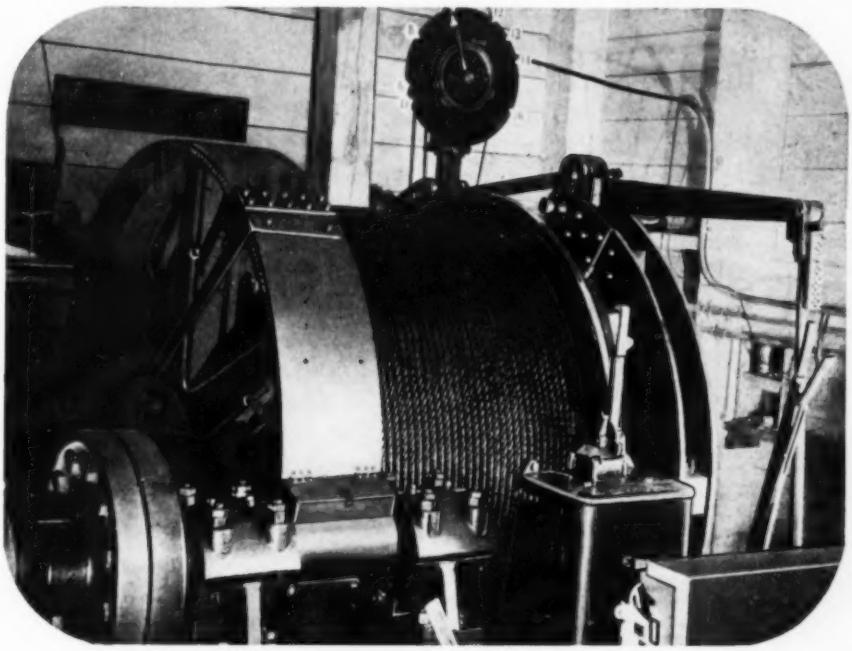
J. G.

**Offered exclusively by*

THE W. R. STAMLER CO.

PARIS, KY.

WIRE ROPE



This is the longest-lasting rope we've ever made for mining

JUST MENTION wire rope and most everyone thinks of Roebling. For one thing, Roebling made the first wire rope in America. But what's more, we've always led in developing better wire rope for the needs of every branch of industry.

Roebling Preformed "Blue Center" Steel Wire Rope is today's best bet for mining service. It's safe, dependable and stands up under rough going. It saves you time and cuts costs.

There's a Roebling wire rope of the right specification for top service on any job. Call on your Roebling Field Man for his recommendations. John A. Roebling's Sons Company, Trenton 2, New Jersey.

ROEBLING

ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3253 FREDONIA AVE. • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 815 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, TRENTON 2, N. J.

Promet Bars Stand Up Where the Going Is Tough!

PROMET
THE Engineered BRONZE

CORED & SOLID BRONZE BAR STOCK



Made from Promet No. 6, an outstanding leaded bearing bronze noted for its free machining properties. Unbelievably great resistance to heat and wear. Will not burn, seize, pound out.

PROMET'S HIGH SAFETY FACTOR IS YOUR INSURANCE AGAINST BEARING FAILURE!

Tougher, harder and stronger, it resists shock loads and withstands high compressive forces and will not cut, or stick to the shaft under ordinary operating conditions. There is no seizing, no scoring—just smooth, quiet operation. Will not powder under the most severe conditions of service. When lubrication fails temporarily, Promet carries on safely until proper lubrication can be restored, affording protection against production shutdowns.

PROMET FULLY MACHINED BARS SAVE YOU TIME, TOOLS AND MONEY!

Completely precision machined inside, outside and on the ends, yet sufficient stock remains for the finishing cut. Can be machined at speeds of more than 500 feet per minute—more than double those of phosphor bronzes. This complete machining insures you against subsurface defects sometimes found in rough cast bars. A considerable amount of metal has already been removed—metal which you would be purchasing if you used rough bars. Every bar is absolutely concentric.

Available round, hexagon and square, in 13-inch lengths, rough cast.

MONEY-BACK GUARANTEE

of longer, superior service and lower maintenance cost.

FREE ADVISORY SERVICE

Our competent design and engineering staff will be glad to assist you in solving your special bearing problems.

Send today for free literature.

THE AMERICAN CRUCIBLE PRODUCTS COMPANY

1307 Oberlin Avenue, Lorain, Ohio

Please send free literature on Promet Cored and Solid Bronze Bar Stock.

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City & State .....

came to the U. S. For many years Mr. Evans worked in mines in various western states, holding all jobs from miner to superintendent. At one time he was foreman and superintendent, Pacific Coast Co., and superintendent, Big-4 Coal Co. Mr. Evans had a total of 56 yr underground with no lost-time accidents.

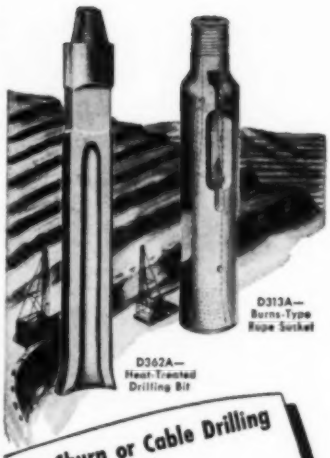
Mark J. Luksic, 64, operator of the Pringle Coal Co., Wilkes-Barre, Pa., died Aug. 24. He was born in Austria and his first job in the U. S. was a slate-picker in the mining operation that he acquired in 1947 and operated until his death.

John H. Quinn, 81, formerly partner of the Quinn & McDonald Coal Co., died Aug. 30 at his home, Lost Creek, Pa., after a long illness. A certified mine foreman and superintendent of various mines in the Lost Creek Region, Mr. Quinn also spent 3 yr in the coal industry of England.



Company Advertising Boosts Mine Towns

A NEW "MINE TOWN SERIES" of advertisements designed to serve the communities in which it has coal mines is being released every 2 wk by the Sinclair Coal Co. to all newspapers throughout the Middle West in those communities. As shown in the above sample, there is space for the name of the town and free listing of town meeting dates, school and church activities and other civic or community events. The newspapers keep the calendars up to date, and the company reports that the series have been enthusiastically received by not only the newspapers but by the superintendents and operating heads of the various Sinclair mines, who pay the full cost of the advertisements. The consumer brand name and the name of the local operating company are included.



For Churn or Cable Drilling of

- **BLAST HOLES**
- **PROSPECT HOLES**
- **SAMPLING**

SAFE • EFFICIENT • ECONOMICAL

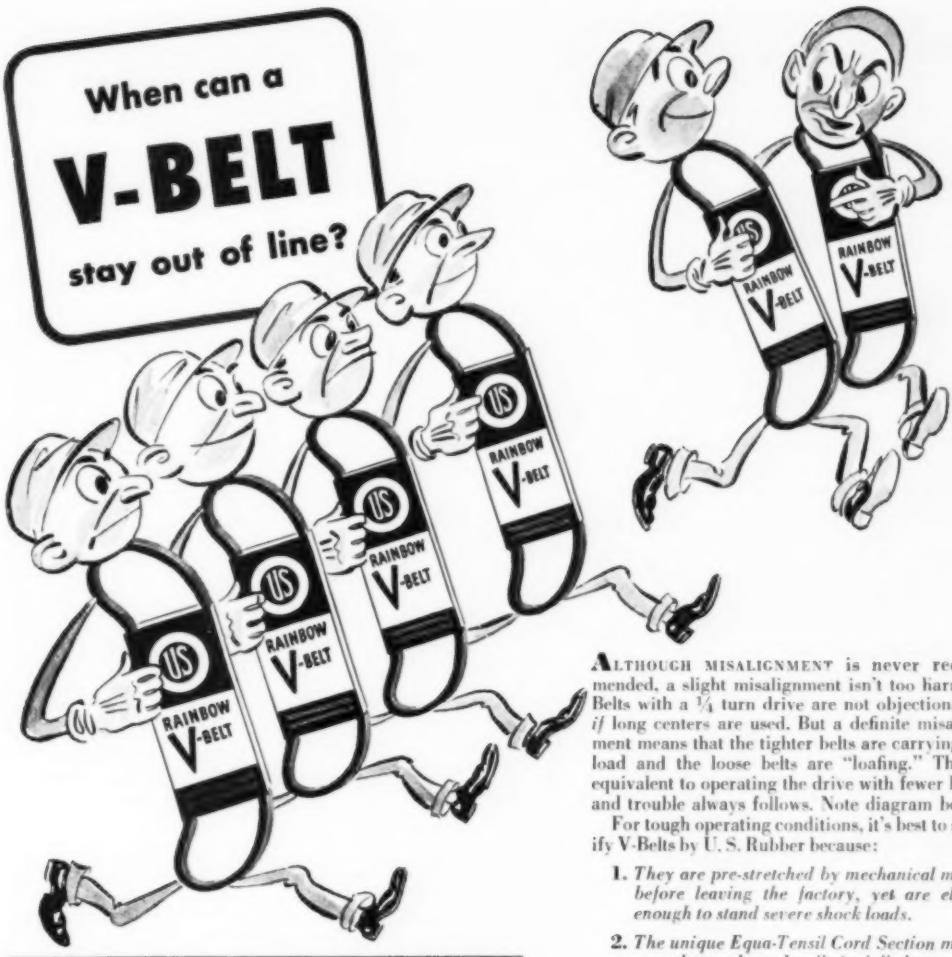
Spang Churn or Cable Tools are top performers in their fields for drilling test holes when prospecting or sampling . . . drilling blast holes for fragmentation of minerals or overburden . . . drilling and reaming escape, dewatering and ventilating holes . . . and drilling wells for other purposes. Fifty years' experience serving oil, water-well, mining and quarrying operations assures their value.

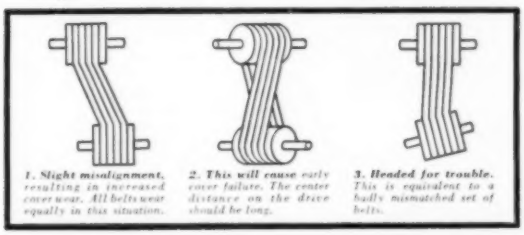


LARGE BITS for pilot hole drilling and stage enlargement reaming of dewatering, ventilation and escape holes.



When can a V-BELT stay out of line?





1. Slight misalignment, resulting in increased cover wear. All belts wear equally in this situation.

2. This will cause early cover failure. The center distance on the drive should be long.

3. Headed for trouble. This is equivalent to a badly mismatched set of belts.

ALTHOUGH MISALIGNMENT is never recommended, a slight misalignment isn't too harmful. Belts with a ¼ turn drive are not objectionable, *if* long centers are used. But a definite misalignment means that the tighter belts are carrying the load and the loose belts are "loafing." This is equivalent to operating the drive with fewer belts, and trouble always follows. Note diagram below.

For tough operating conditions, it's best to specify V-Belts by U. S. Rubber because:

1. *They are pre-stretched by mechanical means before leaving the factory, yet are elastic enough to stand severe shock loads.*
2. *The unique Equa-Tensil Cord Section makes sure that each cord pulls its full share of the load so that the belt has efficient pull and strength under diverse conditions.*

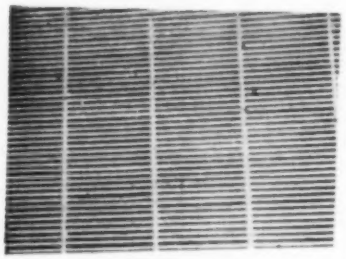
United States Rubber Company has the largest assortment of V-Belt molds in the world. If you want a "special" in a hurry, chances are it can be obtained without making a new mold. Moreover, to handle specific and special conditions, not usually encountered, these belts can be had with special properties. Order from your jobber, or for more information write to address below.

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Wedge-Slot Screens on Drag Conveyors



The Sunnyhill Coal Company has found that stainless steel Hendrick Wedge-Slot Screens installed on drag conveyors that carry washed coal at its New Lexington, Ohio, preparation plant, have given as much as two years of satisfactory service before requiring replacement.

These drag conveyors move coal ranging from 1¼" x 2" to ¼" x 0, and by using Wedge-Slot Screens on them, dewatering is most efficiently continued while the washed coal is being moved, reducing free moisture to a minimum.

Hendrick Wedge-Slot Screens can be furnished to fit any type of equipment, moving or stationary; and with bars of the most suitable profiles and slot widths to meet any specific requirement. Write for full information.

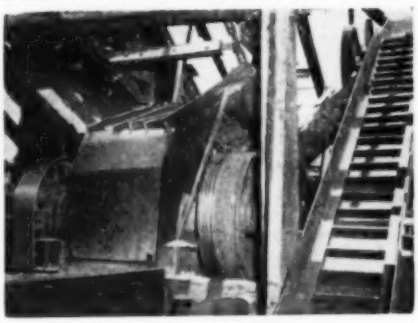
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New Developments

Pa. Coal & Coke Seeks Germanium in Coal Seams

Plans for an exhaustive cooperative investigation of all mines and coal seams in the Appalachian region in the hopes of finding germanium, the "new magic mineral," in commercial quantities, were announced Sept. 13 by the Pennsylvania Coal & Coke Co., Philadelphia, along with an invitation to all coal producers to participate in the search. Ranking with titanium and uranium as a rare and highly essential metal, germanium now is in greatly increased demand because of its use in electronics. In the pure state, it is worth about $350 a pound. It is a component of the transitor, a revolutionary electronic device recently announced by Bell Laboratories. Concentrations of germanium are found, it is reported, in the organic matter of coals, generally in the top and bottom 5 in. of the seam, and the W. Va. Geological Survey has found the metal in appreciable quantities in several coal seams in the state. Pennsylvania Coal & Coke seeks samples from various mines operating the over-all Appalachian area and is prepared to furnish approved instructions for taking and shipping coal samples, without obligation. It reports that it has been made agent for procuring coals containing germanium by the nation's largest producer of the metal. It believes the area may contain "untapped veins of hidden wealth," according to Harry Brown, representative for the firm in Fairmont, W. Va.

Maumee Collieries Co. Opens New Indiana Properties

The opening last month of the new Airline Mine No. 32 of the Maumee Collieries Co., mining the No. 5 seam west of Linton, Ind., has been announced by Hugh B. Lee, vice president and general manager. Stripping is being done with the company's 15-W dragline, with a 215-ft boom and 15-yd bucket, and coal is being prepared at the Sponsler tipple, which is double-shifting to handle coal from the new property and from Sullivan No. 27 on the seventh vein. The company also is breaking ground this fall for its new Old Glory No. 33 mine, at Coal City, which will replace Old Glory No. 17, in operation since 1925. Earlier in the year, a small new mine, Ayrdale No. 31, was put into operation on the No. 3 seam, with coal prepared at the Linton No. 28

Tell Others, Too . . .

NEWS OF YOUR ORGANIZATION is also interesting to others, so why not make it a point to inform COAL AGE of personnel changes among your staff members, mine-development plans and unusual activities. Write The Editor, COAL AGE, 330 West 42nd St., New York 36.



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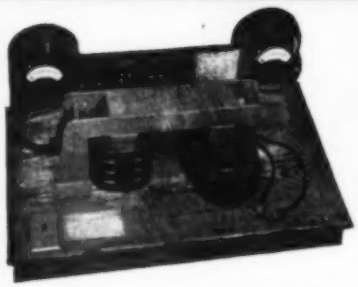
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Quickly and positively locates faults in field and armature coils

Simple to operate, the Flood City Field Coil Testing Machine provides a quick means of locating faults in field and armature coils. With series coil under test even a single short circuited turn instantly registers on the ammeter. Shunt fields are tested by measuring the induced voltage as compared with that of a standard coil.

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tipple. During the spring, installation of Baughman driers was completed at the Sponsler preparation plant, with a similar installation made at the Linton No. 28 plant late in 1951. The company currently is operating six mines, with an annual capacity of 2½ to 3 million tons, and at all the properties the stripping equipment is a dragline, Mr. Lee reports.

Lehigh Valley Plans to Enlarge Dorrance Breaker

Construction of an additional building to house new latest-type preparation equipment at its Dorrance colliery was begun last month by the Lehigh Valley Coal Co., Wilkes-Barre, Pa. The enlargement program, which is expected to cost some $400,000, is planned to make the plant more efficient and one of the best breakers in the region. When the work is completed, Dorrance will receive coal by railroad from the Henry, Franklin and Westmoreland operations, presently prepared at Prospect colliery, which has an old-type wooden breaker.

And For Your Information . . .

A merger of the Hatfield-Campbell Creek Coal Co. with the Amherst Coal Co. is scheduled to come before a meeting of Amherst Coal stockholders in Charleston, W. Va., Oct. 6. The merger of the two affiliated companies is based on an exchange of 40 shares of Hatfield-Campbell Creek for one of Amherst Coal.

The design and construction of a new battery of 57 chemical-recovery coke ovens will be carried out by the Koppers Co., Pittsburgh, for the Algoma Steel Corp., Ltd., Sault Ste. Marie, Ont. The ovens will each take a 17½-ton charge of coal, operating on a 17-hr coking cycle.

The Kemmerer Coal Co., Frontier, Wyo., has announced plans for the construction of an experimental retort plant for the drying and upgrading of coal from its Elkol mine to meet expanding market requirements. Construction of the plant has been awarded to Petrocarb Equipment, Inc., New York.

Preparation Facilities

Valley Camp Coal Co., Elm Grove, W. Va.—Contract closed with Jeffrey Mfg. Co. for one No. 200 unit washery; capacity, 160 tph, 5x¼.

Erie Concentrated Coal Co., Avoca, Pa.—Contract closed with Wilmot Engineering Co. for one Wilmot-Daniels froth-flotation concentrating plant with one 8-ft diameter by 8-ft deep conditioner and one 10-cell No. 48 agitator froth-flotation machine for preparing 28 to 150 mesh anthracite at a feed rate of 35 tph.

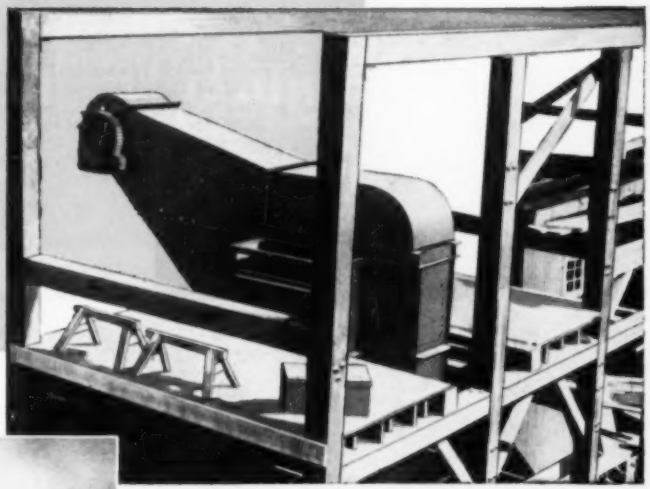
Dawson Collieries Co., Dawson Springs, Ky.—Shipment by Deister Concentrator Co. of two SuperDuty Diagonal-Deck No. 7 coal-washing tables and one Concenco Model 109 revolving feed distributor.

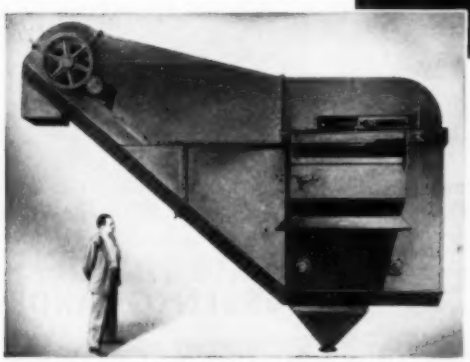
Lynnville Coal Co., Buckskin, Ind.—Shipment by Deister Concentrator Co. of 15 SuperDuty Diagonal-Deck No. 7 coal-washing tables, and four Concenco

50% LESS FLOOR SPACE

Needed for *New* Wilmot-Daniels Heavy Density Unit

Unequalled Compactness Results from Its Complete-in-1-Unit Construction and Elimination of 5 Major Parts and 4 Motors. Unit Is also Custom-Designed to Fit Your Space. New System Eliminates the Two Most Common Heavy-Media Problems.





Above, size 150-A Wilmot-Daniels Heavy-Density unit; feed capacity, 150 tons per hour. Also available in sizes for finished product capacities of 50 to 500 tons per hour. Wilmot-Daniels units are furnished in 4 types to fit varying plant set-ups. All are of the complete-in-1-unit construction shown above.

The really revolutionary nature of the advances in efficiency made by the new Wilmot-Daniels heavy-media unit is indicated by the fact that it requires 50% less floor space. To this real reduction in capital cost, add the direct saving that results from the fact that the Wilmot-Daniels Heavy-Density unit is custom designed to your requirements and local conditions. You are not forced to adapt your plant to a "package" unit.

Remarkable simplicity is another advanced feature. The unit contains 5 less major parts and 4 less motors. It employs many standard parts for ease of maintenance. The refuse conveyor, for instance, is of the conventional flight type.

Let us send you Bulletin 521 describing the complete technical details of how this new system operates to increase yield and promote product control for both metal and coal producers.

Send for BULLETIN 521

WILMOT

WILMOT ENGINEERING CO. HAZLETON, PA. Plant: WHITE HAVEN, PA.

HEAVY DENSITY DIVISION

Model 108 revolving feed distributors for feed distribution.

Bowman Coal Co., Saltsburg, Pa.—Contract closed with Jeffrey Mfg. Co. for one No. 100 unit washery; capacity, 125 tph, 5x0.

Ridgewood Coal Co., Peach Creek, W. Va.—Contract closed with Fairmont Machinery Co. for installation in present plant of a C & MI standard 30-in Model E drier for handling 30 tph of 3/16 x 0.

Wheeling Steel Co., Harmersville, Pa.—Contract closed with Eimco Corp. for one 8-ft 10-in diameter 10-disc vacuum filter with auxiliary equipment for complete filter station to handle fine-coal underflow from cyclones, 89% minus 200 mesh; capacity 15 tph.

Kaiser Steel Corp., Sunnyside, Utah—Contract closed with Eimco Corp. for two 8-ft 10-in diameter 8-disc vacuum filters with auxiliary equipment for complete filter station to dewater fine-coal underflow from a thickener with 28x0-mesh coal; capacity 45 tph.

New Books for Coal Men

Analyses of Foreign Coals, by R. E. Morgan and J. F. Barkley. USBM, Bulletin 512. 30c, Supt. of Documents, Government Printing Office, Washington 25, D. C.

Estimate of Known Recoverable Reserves of Coking Coal in Knott County, Ky. by J. J. Dowd, A. L. Toenges, R. F. Abernethy and D A Reynolds. USBM, R. I. 4897. 8 x 10½-in.; paper; mimeo. Free, Publications Distribution Section, 4800 Forbes St., Pittsburgh 13, Pa.

Handbook of Motion Picture Technique for Business Men, by Charles Curran. 53 pp. 8½ x 11-in.; paper. $2.50, Times Square Productions, Inc., 145 West 45th St., New York 36, N. Y.

Active List of Permissible Explosives and Blasting Devices Approved Previous to Dec. 31, 1951, by G. H. Damon and N. E. Hanna. USBM, I.C.7640. 12 pp. 8 x 10½-in.; paper; mimeo. Free, Publications Distribution Section, 4800 Forbes St., Pittsburgh 13, Pa.

Core Drilling at Shaft Sites of Proposed Mine-Water Drainage Tunnel, Anthracite Region of Pennsylvania, by S. H. Ash, R. E. Doherty, P. S. Miller, W. M. Romischer and J. D. Smith. 43 pp. 8x10½-in; paper. 30c, Supt. of Documents, Government Printing Office, Washington 25, D. C.

A Study to Determine Factors Causing Pressure-Piling in Testing Explosion-Proof Enclosures, by E. J. Gleim and J. F. Marcy. USBM, R. I. 4904. 8x10½-in; paper; mimeo. Free, Publications Distribution Section, 4800 Forbes St., Pittsburgh 13, Pa.

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SCREEN GUARDS

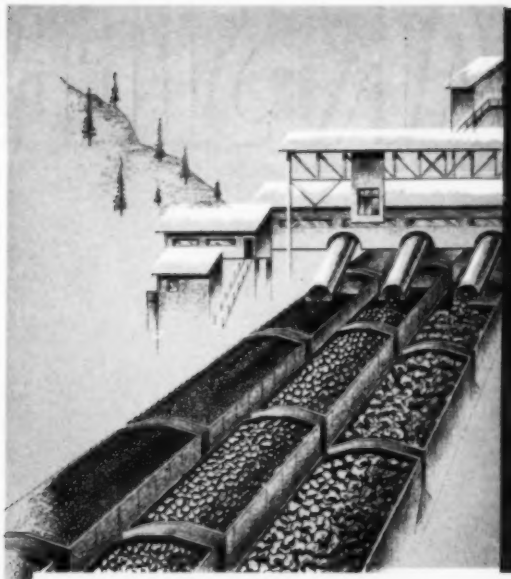
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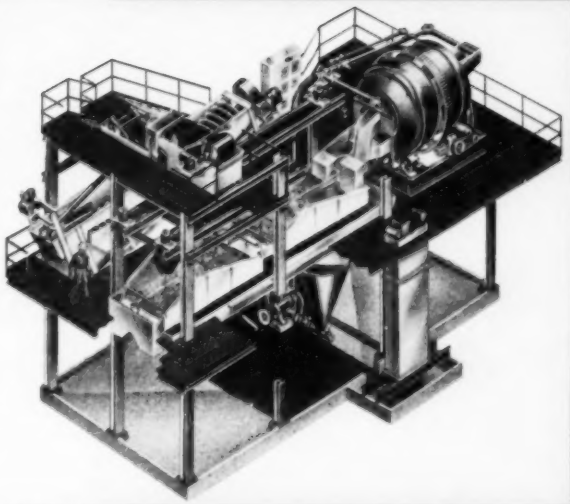
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Mobil Mill cleaning is **precision cleaning**. It provides close control of washing operations and the flexibility needed for efficient cleaning over a wide range of sizes and grades. For coals containing middlings, the WEMCO MOBIL MILL with Double Drum Separator is the **only** HMS plant capable of producing **three** products by absolute gravity control. Accurate segregation of bone and other middlings from true float coal and true refuse permits re-crushing and washing of this middling to produce a salable third product.



To fit your particular requirements, Mobil Mills are offered in a number of sizes with a choice of three basic types:

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3. ***Cone Type Mobil Mill** for efficient, large volume production of fine coal in sizes 4" to 3/32", with capacities up to 420 TPH.*

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LONE STAR STEEL



It takes Tournadozer only 45 minutes to clean around 4 draglines and a shovel over a 1.3 mile distance.



After 3000 hours work in highly abrasive materials, substantial part of original tread still remains on Tournadozer's 21.00 x 25 low-pressure tires. After further use, these tires will be re-treaded for additional mileage.

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R. G. LeTOURNEAU, INC.,

PEORIA, ILLINOIS

replaces 3 crawlers with 1 Tournadozer

"Very fine for clean-up work," says Supt. W.L.KENDRICK

Texas' largest pig iron producer, the Lone Star Steel Co. of Dallas, has greatly simplified and speeded clean-up operations at their Daingerfield open pit mine by replacing three 144 h.p. crawler tractors with 1 high-speed rubber-tired 186 h.p. C Tournadozer.

The 19 m.p.h. Tournadozer regularly serves 3 to 5 draglines and shovels . . . while, previously, each crawler could clean up around only 1 or, at the most, 2 excavators. In addition, Tournadozer handles a lot of widely-scattered dozing jobs . . . is literally all over the mine, 16 hours a day, 6 days a week, helping keep daily ore production at scheduled 15,000 tons. As W. L. Kendrick, Lone Star's division superintendent and a veteran of many years on the Mesabi Range and at Daingerfield, describes it:

"For our work, where speed, mobility and power are essential, Tournadozer has proved very satisfactory. It's a fine machine for cleaning up around shovels, pushing trucks in soft footing, and doing miscellaneous dozing. We are very pleased with its performance."

These "miscellaneous" tasks at present include: blading and cleaning haul roads . . . dozing overburden . . . cutting ramps from haul roads to loading areas . . . preparing dragline sites . . . and hauling equipment. Material ranges from rock and heavy limonite ore (weighing over 4,100 lbs. per cu. yd.) to sand, clay, and even gumbo. Tournadozer does particularly well in pushing trucks through soft going, because its speed and the smooth control of its instant-shift transmission keep it pushing steadily against truck as footing improves and haul speed increases.

3000 hours, 90% efficiency, tires still good

With 3000 hours of rugged service on these tough, high-speed assignments, Tournadozer has given over 90% efficiency. Despite the abrasive, rocky materials, the "C's" 21.00 x 25 low-pressure tires *still carry a substantial part of their original tread* (see photos). After additional wear, the tires will be re-treaded.

This is just one of a series of world-wide jobs where rubber tires, *rolling on dirt*, sand, rock and ore, are proving far more productive and economical than tracks *wearing in dirt*. See your LeTourneau Distributor for all the facts . . . let him demonstrate to you that frequent and costly track repairs can be eliminated. Let him show you how Tournadozer's 19 m.p.h. speeds, its simple steering controls, and electric-controlled down-pressure blade will move more dirt at a lower cost.

READ WHAT MEN WORKING THIS JOB SAY ABOUT TOURNADOZER

M. J. Hughes, mine superintendent, "It's the best machine I've ever run into for the kind of work we have it doing. It can't be beat in open pit mining."

R. T. Dudley, mine foreman, "I don't see how we ran the mine before we had the Tournadozer."

Wiley E. Martin, Tournadozer operator, "Tournadozer is easy to operate and easier on the operator. It's much faster on shovel clean-up and dozing, blading roads, and pushing trucks. I'd rather run it than a crawler-tractor."

Enoch Hooton, Tournadozer operator, "You can't beat the Tournadozer for pit work or clean-up."

186 h.p. Tournadozer moves 2½ cubic yards per push. Optional down-pressure blade and torque converter are available on current production.

Tournadozer—Trademark Reg. U. S. Pat. Off. 8254

HIGH-SPEED, RUBBER-TIRED EXCAVATING • HAULING • LIFTING EQUIPMENT







COAL MEN ON THE JOB . . . Amherst Coal Co., No. 1A Mine, Amherstdale, W. Va.

LEFT TO RIGHT: Jesse Trent, assistant superintendent; Posey White, timekeeper; Allan Mitchem, superintendent; C. E. Nicely, general night foreman; Russell Ward, general mine foreman; Cecil Graham, outside foreman; Oscar Davis, section foreman; and Custer McCann, timber checker.

Up went the profit!...

when big Pennsylvania mine put in the

NOLAN PORTA-FEEDER

The photo at the right shows a 15 H.P. Nolan Porta-Feeder used for moving cars quickly and efficiently, saving time and money day after day, in a big Pennsylvania mine operated by a major steel company. Installations such as this have shown Nolan Porta-Feeder records of savings as high as 40 minutes per shift in spotting cars for loading, for a large number of coal operators.



The Porta-Feeder mounts between the rails on top of the track ties, secured by jacks that permit quick movability. Little or no excavation or preliminary foundation work is necessary.



Strong, massive construction. No ropes or cables, no inflammable hydraulic oil. Short-shaft delivery of power. Quick movability of entire unit.

The drive is on skids and is connected to the gear head by a strong universal joint and propeller shaft assembly. A sealed drive head allows operation in water up to the base of the rails. Reciprocating pushing dogs deliver constant forward feeding motion.

Write for full details immediately.

MODEL	H. P.	DRAW BAR PULL	SPEED	WEIGHT
NL5N	5	6000	25 F.P.M.	5700
NL7N	7½	9000	25 F.P.M.	5850
NL10N	10	9000	35 F.P.M.	6300
NL15N	15	13000	35 F.P.M.	6750

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THE NOLAN COMPANY 106 PENNSYLVANIA ST. BOWERSTON, OHIO

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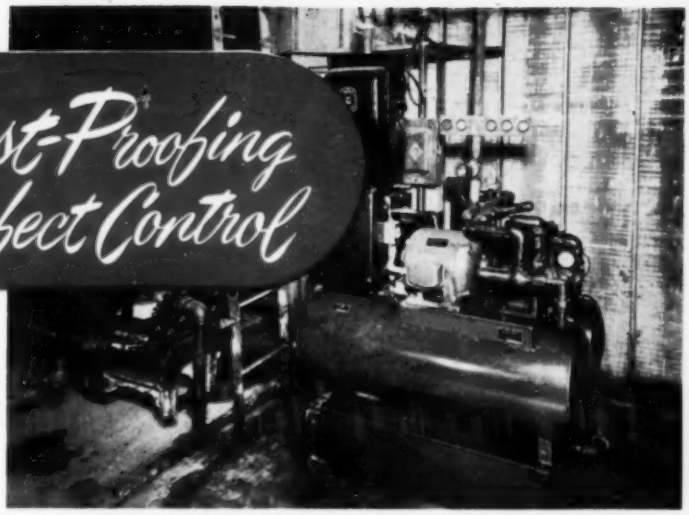


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WITH THE PROPER EQUIPMENT AND

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Ashland PERMATREAT COAL SPRAY

Controlled dust-proofing is a modern mining practice that pays off in a better, more acceptable product for the home user, industrial plant and the shipper. While allaying the dust is a primary factor, there are also many other advantages offered by oil treating with PERMATREAT COAL SPRAY.

On many types of soft coal a minimum amount of PERMATREAT COAL SPRAY is all that is required. With proper spray equipment and carefully controlled application you can save on the amount of oil used and still be sure of a most acceptable product. Where lake shipment is anticipated, many purchasers request additional treatment to protect the coal over a longer period and under atmospheric conditions that may cause degradation. Where slack is being blended with larger sizes, PERMATREAT applied in the proper amount will prevent segregation. Many industrial users of coal are now requesting oil treated coals to facilitate cleaner handling as well as better firing.

Ashland sales engineers are available at any time to discuss your treating problems. They can advise you on the spraying equipment and the grade of PERMATREAT COAL SPRAY best suited to your operations.

CHUTE TYPE





HOOD TYPE

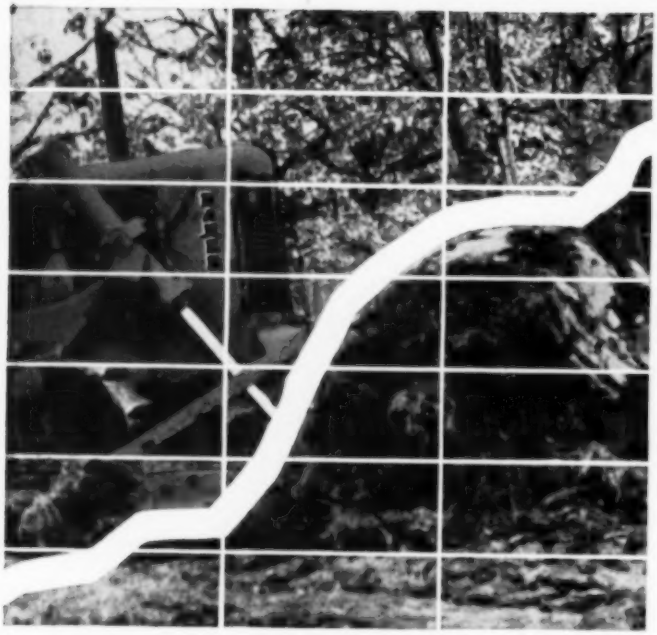
SPRAY TYPE



Ashland PERMATREAT

ASHLAND OIL & REFINING COMPANY

Ashland, Kentucky



Designed with the *Profit Curve* ***in mind . . . !***

Baker Blades have the *maximum* "ROLL-ACTION"—from cutting edge to moldboard top, they're scientifically contoured to roll the load *with minimum resistance.* Thus you get more push from your investment in horse-power—bigger pay-loads from Baker's advanced DESIGN-FOR-PROFIT curve.

Add Baker's job-proved positive down-pressure to "ROLL-ACTION"—plus Baker *fingertip control* and *quick direct-lift*—and you have concrete reasons why more buyers are saying, "I want an A-C with a *Baker* Blade."

Baker Bulldozers, Gradebuilders and Root Rippers—available in engine-mounted hydraulic, frame-mounted hydraulic (the new no-pushbeam 9-X), and cable-controlled units—featuring easy interchangeability—are designed exclusively for the Allis-Chalmers crawler line.

Ask your Baker, A-C Dealer to come out now—get the *complete* facts.

THE BAKER MANUFACTURING COMPANY
Springfield, Illinois



Baker—The *most versatile* line of tractor attachments

Among Manufacturers

N. M. Sedgwick, formerly sales manager, has been named general sales manager of Le Roi Co.'s Construction and Mining Div., Milwaukee. R. H. Rodolf has been appointed manager of rock drill sales, C. L. Meigs, assistant general sales manager of the division, and William D. Lund, assistant to the general sales manager. The promotions were announced as part of the division's expanded sales program.

Jeffrey Mfg. Co., Columbus, Ohio, has named C. W. Hawley, formerly sales manager of the Products Engineering Div., manager of original equipment sales, Merchandise Div. Mr. Hawley, who recently returned from 6 mo with NPA in Washington where he was chief of the conveyor section, has been succeeded by Lester L. Grooms, with the company since 1916, most recently as engineer for the Chain Sales Div.

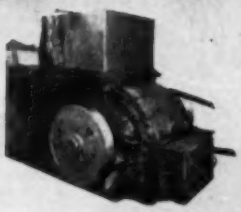
Whiting N. Shepard has been advanced to director of sales, Boston Woven Hose & Rubber Co., Cambridge, Mass., as part of an expanded marketing program "necessitated by increasing diversification of the company's products." Mr. Shepard joined Boston Woven Hose & Rubber last February after 19 yr with the Plaskon Div., Libbey-Owens-Ford Glass Co., and formerly was head of plastics sales for the Boston Company.

Lester J. Hyland, associated with the Thermoid Co., Trenton, N. J., for over 25 yr, has been appointed sales manager of the industrial rubber division. Robert Gentles, district sales representative, has been named to succeed Mr. Hyland as manager of Thermoid's Western Div. industrial rubber products, with headquarters at San Francisco.

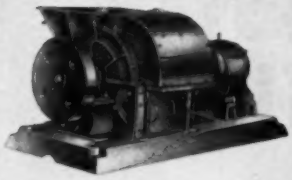
Link-Belt Co., Chicago, has appointed Kendrick M. Hickman assistant sales manager of its Ewart plant in Indianapolis, for Ewart general products. Mr. Hickman, who formerly was manager of agricultural sales at Ewart, succeeds H. M. Bowman, transferred to the Chicago Pershing Road plant to handle sales promotional activities.

Fairbanks, Morse & Co., Chicago, has promoted W. E. Watson, manager of the Pump Manufacturing Div., to assistant to the manager of manufacturing, with headquarters in Chicago. Paul R. Flood, manager of manufacturing of the company's Beloit, Wis., works, has been transferred as general manager of the company's Pomona (Calif.) pump works, succeeding Charles L. Barrett, who has become a consultant to the Pump Div. Lewis H. Kessler has been named chief hydraulic engineer at the Beloit works, succeeding R. C. Glazebrook who has been on special assignment to the general manager in connection with the new Fairbanks, Morse, Kansas City plant. Robert B. Craig, formerly REA deputy administrator and Diesel Engine Manufacturers' Association representative, has been appointed assistant to the president of Fairbanks, Morse & Co., working on special assignment.

FOR HIGH TONNAGE CRUSHING . . .

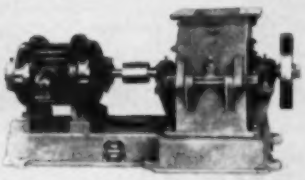


Heavy Duty 30-S. For Primary Crushing. Crushes ROM coal, rock, slate, sulphur balls and gob—high tonnage without oversize. Saves labor costs of pickers.

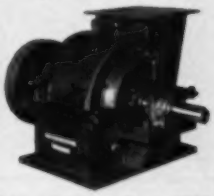


"S" Series. 9 sizes. Capacities up to 500 TPH. High tonnage with minimum fines. Well suited to power plants.

OR COAL SAMPLING . . .



Laboratory Mill. 2 sizes. Capacities up to 2000 lbs./hr. Very efficient for coal sampling.

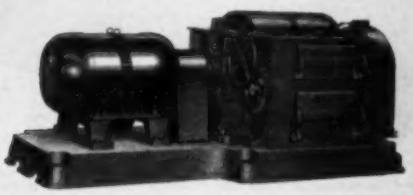


"13" Series. Three sizes. Capacity up to 6 TPH. For experimental runs, testing, and pilot plant operations.

THERE'S AN *American* ROLLING RING CRUSHER . . . FOR YOUR OPERATION!



"WC" Series. 4 sizes. Capacities up to 90 TPH. Available with drop cage. Compact, requires minimum headroom.



"AC" Series. 17 sizes. Capacities up to 800 TPH. Dual adjustability for easy size control. Drop cage for easy cleanout.

WRITE for details today. Describe your crushing needs.

American PULVERIZER COMPANY

Originators and Manufacturers of Ring Crushers and Pulverizers

1119 Macklind Ave.
St. Louis 10, Mo.

4 STAR TIMER

HYDROGEN PACKED

- ★ No false contacts
- ★ No chatter
- ★ Quiet in operation
- ★ Eliminates double contacting or breaking of circuit

Durakool
STEEL MERCURY TIMERS



The steel-clad "fixed time" Durakool timer-relay operates in "sealed in" hydrogen under pressure, with mercury to mercury contacts. Timing is tamperproof. Non-breakable and built for millions of contacts. Fixed time delays available from 1/6 to 20 seconds, either normally open or normally closed action.

See Telephone Directory for Local Distributor or write Durakool, Inc. Elkhart, Indiana

Send for Bulletin 800

MOVE MORE COAL AT LESS COST



Atlas 5-ton type F 32" high.

Can be made 28"

The Atlas two-motor 5 ton type F storage battery locomotive is built low to go anywhere mine cars will go. Exposed wheels for easy access. Large battery capacity gives more gathering service per shift. Double reduction spur gear drive in heavy dust-tight housing gives economical maintenance-free service. Ask for details today!

Atlas Engineering service will design locomotives to meet the specific needs of your mine.

THE ATLAS CAR & MFG. CO.

ENGINEERS MANUFACTURERS

1140 IVANHOE RD. CLEVELAND 10, OHIO, U. S. A.

S. L. Fry, formerly manager of the Omaha branch diesel department, has recently been appointed assistant manager of the Pump Sales Div., with headquarters in Chicago.

Franklin E. Rhine, of the Sterling Steel Casting Co., East St. Louis, Mo., retired last month after some 30 yr of association with the mining industry. He and Mrs. Rhine expected to leave for Florida late in the month, with plans to locate permanently in Sarasota.

C. R. Boll, Jr., has been named general sales manager of the Cummins Engine Co., Inc., Columbus, Ind. Mr. Boll, who joined Cummins in 1941 as a sales engineer after graduation from Purdue, had served as manager-engine sales since 1948.

A majority interest in the LeRoi Co., Milwaukee, has been acquired by the Westinghouse Air Brake Co., Wilmerding, Pa., through purchase of common stock from LeRoi stockholders. According to E. O. Boshell, president and chairman of the board of Westinghouse Air Brake, the acquisition is a further advance step in the company's diversification program and "it is our intention to retain the name, organization, officers, employees, plant locations and operations of the LeRoi Co."

Carl R. Sare, formerly assistant to the president, Patterson Foundry & Machine Co., East Liverpool, Ohio, has been elected vice president of The W. W. Sly Mfg. Co., Cleveland. Mr. Sare will be primarily concerned with promoting dust-filter sales.

U. S. Steel Co., Pittsburgh, has announced the appointments of F. Royal Gammon as assistant vice president-sales, eastern area, and of Herbert J. Watts as assistant vice president-sales, western area. Mr. Gammon and Mr. Watt, formerly managers of sales for their respective areas, will serve as representatives of the vice president—sales in their new posts. Fred H. Lucas, formerly assistant manager of sales in Pittsburgh, has been made manager of structural and plate sales, in the U. S. Steel Co's. sales division, succeeding A. H. Warren Jr., who is retiring after 43 yr of service with the company. Meryl H. Geisking, formerly vice president and general sales manager for TCI, has been named to the newly created position of assistant to president, Tennessee Coal & Iron Div., and has been succeeded by David A. Challis Jr., assistant general manager of sales for U. S. Steel Co. in Pittsburgh. In his new post, Mr. Geisking will be active in helping to promote the industrial development of the South, which constitutes TCI's market area.

J. C. Miller has been named executive engineer in charge of all product engineering and research for the Cummins Engine Co., Inc., Columbus, Ind. He had been manager—research and refinement since joining the company in 1947.

Edward B. Blanc has been appointed sales engineer for the Drill Steel Div., Crucible Steel Co. of America, with head-



• We give up . . . Without coal, the vital steel industry of today could not exist. Without steel, the enormous tonnage of coal needed by the steel industry could not be produced or delivered. Here is another example of the interdependence of two basic industries!

We can report *this*, however: The mines in Baltimore & Ohio territory are prepared and equipped to go right along with the steel industry in its expansion program. Too, there are millions of tons of untapped reserves of coking coals available for development.

These coals are available in varieties for all coking needs. They are easily accessible, and in plentiful supply for long-range planning. Whatever your requirements, let us advise you. Just *ask our man!*



BITUMINOUS COALS FOR EVERY PURPOSE

LINKING 13 GREAT STATES WITH THE NATION — B&O

BALTIMORE & OHIO RAILROAD

Constantly *doing things* **—better!**

How deep is the overburden?

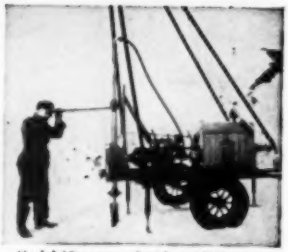
Why guess when these low-cost, easy to operate Acker LD Core Drills tell you

Quickly!

Easily!

Inexpensively!

1. Quality of Coal
2. Thickness of Seam
3. Depth of Overburden



Model LD powered with a 12HP motor for depths to 300'.



Model LD powered with a 7HP motor for depths up to 150'.

For simplicity of design and operation you just can't beat the Acker LD. We've kept moving parts to a minimum and eliminated all feed gears or screws. (Elimination of unnecessary parts cuts down weight, too—an advantage when operating in isolated locations.)

Our newly designed double tube core barrel retrieves samples even where others fail!

Your choice of power and mounting.

Write today for prices and Bulletin 21CA

ACKER DRILL CO., INC.
SCRANTON 3, PA.

New and Better Diamond Bits
for
Modern High Speed Drilling

Always a leader in its field, Sprague and Henwood, Inc. has been working for a number of years on the development of new types of Diamond Bits, to supplement their well-known "TRUCAST" bits, which are still unsurpassed for many diamond drilling requirements.

NOW, after having been thoroughly proved by Sprague and Henwood's contract drilling crews, under every variety of drilling conditions, these new bits are available to other users. Two new types of "Powdered Metal" matrices; improved "Cast Metal" matrices; "Impregnated" coring bits; a new faster-cutting "Taper" bit for drilling blast holes in very hard rock —are all illustrated, described and tabulated in a new 16-page bulletin, No. 320. Write for it today if you can use it to advantage.



DRILLING MACHINES
and Accessory Equipment

To get the full benefit of our new diamond bits you need drilling machines with plenty of power and a wide range of both speed and feed. Model 40-C is our latest-model core-drilling machine and can be relied upon for best possible all-round results on holes up to 1000 feet in depth. Other modern machines provide for very deep core-drilling and for either core-drilling or blast-hole drilling underground. We also manufacture a complete line of improved accessory equipment. Illustrated bulletins containing detailed information mailed promptly.

CONTRACT DRILLING

We do drilling by contract and are one of the oldest and largest contractors for any type of core drilling. Experienced crews are available at all times for service anywhere in the world. Estimates submitted promptly on request.

SPRAGUE & HENWOOD, Inc. Scranton 2, Pa.

See our four-page insert in the Mining Catalogs

quarters at the Park works, Pittsburgh. Mr. Blanc, with Crucible since 1944 as a salesman in the Boston branch will serve customers in the eastern United States.

Blaw-Knox Co., Pittsburgh, has named George L. Dirks general manager of its Blaw-Knox Div. at Blawnox, Pa., succeeding D. V. Sherlock, who returned from retirement to serve temporarily as acting general manager. Mr. Dirks previously was general manager of the Canadian Div. of Yale & Towne Mfg. Co.

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The fourth biennial Materials Handling Conference, sponsored by Westinghouse Electric Corp., will be held in Buffalo, N. Y., Oct. 28-29. This year's conference will deal mainly with "advanced techniques of material handling," both from the application and design viewpoint. Among the papers and authors on the program are: Long-Decline Conveyor Drives, R. U. Jackson, Hewitt-Robbins, Inc.; An Improved Control for Wound Rotor Motors, W. J. Heacock, Link-Belt Co.; Demonstration of AC and DC Precision Crane Control, H. M. Shuff, Westinghouse Electric Corp.; Conveyor Control Incorporating Magnetic Amplifiers, S. W. Jessup, Jarvis B. Webb Co.; Adjustable-Voltage Coal Unloader, H. G. Dillon, Heyl & Patterson Corp.; and Tackling Materials–Handling Problems, R. W. Mallick, Westinghouse Electric Corp.

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DO YOU "STACK" MATERIALS?



DO IT BEST WITH BARBER-GREENE CONVEYORS!

If you "stack" or stock-pile materials, quite probably you can streamline your operation with a Barber-Greene Stacker Conveyor.

Stacker Conveyors—a Barber-Greene development—deliver more material at less cost. First of all, the initial cost is less because you build the system with components selected from the complete, standardized B-G line, eliminating the expense involved in designing and erecting a "tailor-made" system. Secondly, you save during the system's entire life, thanks to reduced operating costs.

There are three basic stacker conveyors—radial, traveling and fixed types—and your B-G distributor is ready to assist you in selecting the kind best suited to your needs.

TYPICAL STACKER APPLICATIONS

- For the stock-piling of bulk materials such as sand, gravel and aggregates
- In mining operations where ore or coal is stock-piled to suit market or seasonal conditions
- In material yards, ready-mix plants or coal yards where classification into separate bins or large stock piles is advantageous for meeting peak demands
- For disposal of waste material
- Wherever structural supports in stock pile handicap operation of reclaiming machines

write for information!

282-A

Barber-Greene

BG

Aurora, Illinois, U. S. A.

How deep is the overburden?

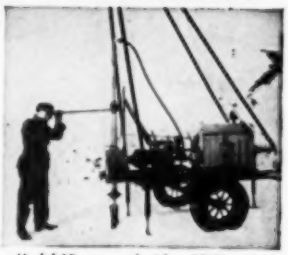
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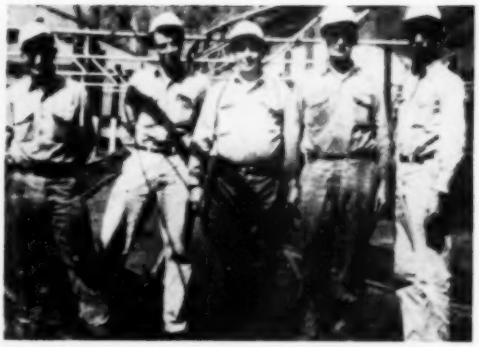
282-A

Barber-Greene

BG

Aurora, Illinois, U. S. A.





COAL MEN ON THE JOB . . .

EMPEROR COAL CO., Emperor No. 1 mine, Freeburn, Ky. (left photo): Monroe DeBoard (seated, left), general mine foreman in charge of the Freeburn plant; R. C. Denny, vice president and general manager for the company; A. U. Schaffer, chief clerk; R. R. Armstrong (standing, left), general assistant mine foreman at Freeburn; and C. B. DeVenny, chief electrician.

AMHERST COAL CO., night crew supervisors, No. 1A mine, Amherstdale, W. Va. (right photo): Bob Seay (left) and Tom Weir, section foremen; C. E. Nicely, general night foreman; Hobert Burton, Clarence Sias, sect. foremen.

Specify **DEMING** *Mine* **PUMPS**



• Continuous performance under severe conditions at low operating and maintenance costs make DEMING MINE PUMPS your dependable source for pumping equipment. The complete line offers you a wide selection for types, sizes and capacities. Two examples are illustrated.

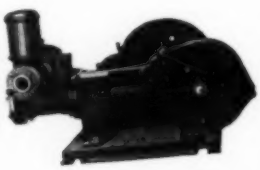
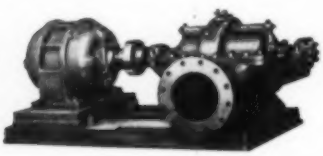


Fig. 1896 "Oil-Rite" Double-Acting Mine Pump, 5 and 6-inch stroke. Several types of drives available. Capacities range up to 100 gallons per minute.



Single Stage, Split Case Centrifugal Pumps, Figs. 5010, 5020 and 5030. Full range of capacities up to 4,000 gallons per minute.

Refer your pump requirements to your Deming Distributor. He will be glad to cooperate with you. Write for Bulletin 1000-A which explains the various types of Deming Mine Pumps.

THE DEMING COMPANY
533 BROADWAY • SALEM, OHIO

USE

FLEXIPIPE

. . . the quality ventilating tubing



DIRECTS FRESH AIR WHERE YOU NEED IT

The new improved Flexipipe is efficient, serviceable and economical. It's made in a variety of diameters and lengths and with various accessories to take care of your requirements. Write us for complete information and sample.

BEMIS BRO. BAG CO.
412 Poplar Street • St. Louis 2, Mo.

get the inside story

for producing

MORE COAL

at

LESS COST



granulation does it!

Exclusive! Heaving and spreading action just the way you want it . . . slow . . . efficient! That's because *every grain* of King's Red Crown patented granular structure contains a balanced explosive composition. Red Crown is the most effective, most efficient form of controlled-power ever provided in Class A permissibles.

Red Crown produces more, better, cleaner lump coal with a minimum of slack . . . at less cost per shot. Less smoke . . . less fumes . . . less down-time.

Write or phone today for a Red Crown demonstration right in your mine. Red Crown cuts your costs, increases your production . . . and we'll prove it to you.



KING

RED CROWN

THE ONLY SURFACE SENSITIZED PERMISSIBLE

THE KING POWDER CO., INC

CINCINNATI 1, OHIO

*MAKERS OF QUALITY EXPLOSIVES SINCE 187**

Can You Check YES to these five questions?

- ☐ Do the gears you use have surface-hardened teeth?
- ☐ Are the cores tough, ductile, and shock-resistant?
- ☐ Do they always fit perfectly and require no run-in?
- ☐ Are they guaranteed to give maximum service life?
- ☐ Are you completely satisfied with them?

If not, you should use—

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—Your Guarantee of Longer Life

GUARANTEED PITTSBURGH ARMORED GEARS

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ARMORED GEARS are made only by PITTSBURGH GEAR from an exclusive formula perfected by PITTSBURGH engineers. It covers metal, machining, and a method of heat-treating that hardens the wearing surfaces but leaves the core tough, ductile, and shock-resistant.

All PITTSBURGH gears are made to extremely close tolerances to fit perfectly right from the start. They are guaranteed to give you five times the life of untreated gears, one to one and one-half the life of oil-treated gears, and equal or longer life than any other gear in identical service.

You can readily identify **Armored Gears** by their distinctive corrosion preventive coating—"**Pittsburgh Purple.**"

You'll save money if you use PITTSBURGH **Armored Gears.** See your nearby PITTSBURGH GEAR distributor who stocks standard renewal gears and parts, or write us for his name.

GEARS and PARTS for LOADERS CUTTERS LOCOMOTIVES ETC.



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engineering and research activities. The staff of the engineering and research departments will remain intact, with L. C. Rotter as chief engineer.

Coal Mine Equipment Sales Co., Terre Haute, Ind. celebrated its 40th anniversary Sept. 4. Present for the ceremonies was Frank J. Wolfe, recently recovered from injuries suffered when his car was forced off the road while enroute to the Republican Convention July 3. Mr. Wolfe spent 7 wks in the hospital but reportedly rejoined his son, Sheldon J. Wolfe, on the job early last month.

Electric power, working in an atmosphere of personal and economic freedom never known elsewhere, is the driving force that has skyrocketed our nation and its people to the highest living standard and greatest degree of industrial progress in the world. Such is the theme of a dramatic new sound-color motion picture, "Freedom and Power," produced in Hollywood for the General Electric Co. to give the public a better understanding of the integral role electricity plays in national welfare and security. The 29-min film is the latest presentation in G. E.'s "More Power to America" series of visual programs dedicated to the improvement of the American way of life through the increased use of electricity. The picture graphically depicts the development and importance of the power industry against an inspiring background of the colonists' historic struggle for freedom. Produced to appeal to all types of audiences, it will be made available to industrial firms, schools, service groups, clubs, trade and business associations, etc.

Electric Machinery Mfg. Co., Minneapolis, has appointed W. R. Shook manager of its new Southeast district office in the Georgia Savings Bank Bldg., Atlanta 3, Ga. A Georgia Tech graduate in electrical engineering, Mr. Shook has been in the Cleveland office for the past 6 yr.

E. H. Powell has been appointed assistant manager of General Electric's Richmond, Va., apparatus sales office, a regional sales office with branches in Norfolk and Charlottesville, Va., and Williamstown, N. C. Mr. Powell has been succeeded as manager at Trenton, N. J., by L. S. Brumgard, formerly in central-station work in the Philadelphia office.

Hewitt-Robins, Inc., will increase conveyor-belt production capacity at its Buffalo plant 41% by a new $1 million plant addition scheduled to go into production late in October. The expansion reportedly will make the company one of the world's largest producers of conveyor belts. In addition to rearrangement of the entire belt manufacturing department to streamline production and utilize new mechanical-handling equipment, a new 12,000-sq ft building has been erected and machinery now being installed includes a modern press costing $220,000 which will make belts up to 72-in wide for long-haul conveyors. Dedication ceremonies scheduled for Oct. 25 will be attended by employees, their families and



*QUARTER-MILE ROADBED...sun-baked, ice-swept...*YET STILL ON THE MOVE AFTER 14 YEARS OF COAL HAULING SERVICE!!!

Photographs may not lie; but, here's one that falls far short of telling the whole truth about the remarkable performance records chalked up by this Republic Rubber's Coal Handling Conveyor Belt.

But, then it's quite a story! You can see for yourself there's lots of sky overhead and that means sun . . . constant, unrelenting sun beating down on the conveyor belt surfaces, until seasonal changes bring about onslaughts of rain, snow and sleet.

The load, of course, is coal . . . an abrasive, mine run coal that's dropped through chutes and carried by the belt to stockpiles located throughout the dock area.

With these facts in mind and knowing that when the ship moves out, there's nothing to protect the belt against spraying lake water, consider this:

The belt is now fourteen years old and still going strong!!!

Purposefully, we've left the photo unretouched to show you just what a 14-year old Republic Rubber Conveyor Belt really looks like . . . to show you just how well a Republic Conveyor Belt stands against the ravages of time, hard labor and all the elements can throw at it. Incidentally, the dark spots you see on the belt's surface aren't worn places at all. That's water . . . water that makes ordinary conveyor belts mildew and prematurely fail, but holds few terrors for Republic Conveyor Belting because they're "mildew-proofed"!

It's to your advantage to learn why Republic Conveyor Belts like this can year in, year out, many times outperform and outlast other brands of belting.

Despite abrasion, impact, flexing, weathering or contact with heat, oil and chemicals, Republic Conveyor Belts continue to be your best insurance against breakdowns, short life and high handling costs.

Write us today for the name of your local Republic Rubber Distributor who can offer expert advice and fast service on all industrial Rubber Products.

Remember, whether it's hose, belting, packing or any one of hundreds of different molded and extruded specialties . . . **if it's built of rubber, Republic builds it better!**

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DISTRIBUTORS IN ALL PRINCIPAL CITIES

friends, city and other officials. Thomas Robins Jr., Hewitt-Robins president and son of the inventor, said the plant is being expanded because "belt conveyors are just now entering an era of tremendous growth and more production will be needed to take care of increasing demand."

Wagner Electric Corp., St. Louis, recently purchased from Fulton Iron Works Co. 3 acres of land with four buildings having more than 100,000 sq. ft. adjoining the Wagner main plant. Acquired to increase Wagner's transformer-manufacturing capacity, the buildings will be completely renovated and modernized for manufacture of large distribution, small power and all unit substation transformers. Production of large power transformers will be centralized in the main transformer shop, which will be re-equipped to permit manufacture of transformers weighing up to twice the largest possible with present facilities. Cost of the expansion program is expected to exceed a million dollars.

Opening of its new Denver Colo., warehouse at 4500 York St., has been announced by Raybestos-Manhattan, Inc., Passaic, N. J. The newly erected building has modern office and warehouse facilities designed to facilitate ample stocks and speedy deliveries for the Rocky Mountain region. The new facility is in charge of Elton T. Fair, Jr., sales representative for the territory.

A new stock-carrying branch warehouse and sales office serving the Pacific Northwest has been established by Quaker Rubber Corp., Div. of H. K. Porter Co., Inc., at 2360 N.W. Quimby St. Portland 10, Ore., in line with Quaker's policy of expanding distribution facilities to cover all important industrial areas. Designed to provide prompt service and better deliveries, the new warehouse has 6,000 sq ft of floor space for a complete inventory of industrial rubber products and is under the supervision of Milton M. Clark, district manager.

Establishment of the Ramset Div. as its ninth operating division and the appointment of J. E. Williams as general manager, have been announced by Olin Industries, Inc. The new division will be responsible for the production and sale of powder-actuated tools, fastening studs and accessories, and will operate Ramset Fasteners, Inc., the Stemco Corp., and Portable Industries, Inc., all of Cleveland. Mr. Williams is a former president and founder of the three companies which became Olin subsidiaries last spring.

Huber Mfg. Co., Marion, Ohio, has appointed two new distributors. Brinker Supply Co., Dover, Ohio, a branch of the Pittsburgh office, will cover 14 counties in southeastern Ohio, with E. L. Montgomery as manager. A. E. Hudson Co., of Illinois, with home offices in Morton and branches in Rock Island and Springfield, will handle the territory of central and northwestern Illinois. A. E. Hudson is president; Robert Douglas is branch manager at Rock Island; and R. D. Abrell is branch manager at Springfield.

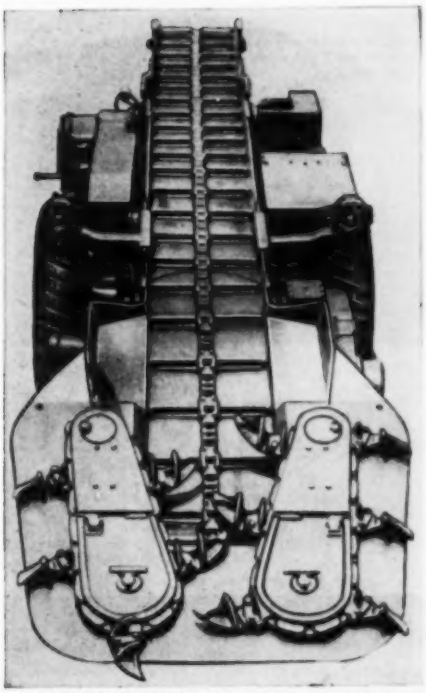
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MARVEL SYNCLINAL FILTERS

Says: John L. Clarkson, President

The Clarkson Manufacturing Co., Nashville, Illinois
"In coal mining the coal dust settles on and around all parts, connections, and fill plugs. When the plugs for fill pipes are removed, invariably small particles of coal dust drop into the tank. When hose connections are connected in the mine, dust coal particles also get into the line. The filter catches this dust on its first trip around and prevents damage to the pump and cylinders. We are very much in favor of your filters."

John L. Clarkson



CLARKSON UNDERGROUND LOAD.NG MACHINE

This machine, widely used in the coal mines, has its vital hydraulic power system protected by the Marvel Synclinal filter. Like over 300 other manufacturers, The Clarkson Manufacturing Company installs Marvel Synclinal filters as original equipment.

INCREASE PRODUCTION REDUCE MAINTENANCE COST

Protect Hydraulic Equipment with Marvel Synclinal Filters

More and more manufacturers and users of hydraulic machines and other equipment with low pressure, non-corrosive liquid systems are depending on Marvel Synclinal Filters to protect their machines' efficiency. Marvel Synclinal Filters are speeding production in a wide range of industries. They offer longer periods of operation between cleanings plus simplicity which enables ordinary workmen to quickly disassemble, clean and reassemble the filter on the spot. Turning a single handnut releases line model for cleaning without disturbing pipe connections.

5 TO 100 G.P.M. SIZES IN SUMP AND LINE TYPES

Both models are available in mesh sizes from 30 to 200. For efficient filtration of non-corrosive liquids in all hydraulic and low pressure systems, Marvel has the right filter protection for your machine.



SUMP TYPE (Cutaway) LINE TYPE (Cutaway)

★ **WATER FILTERS** In response to the great demand we have adapted both our sump and line models for use in all water filtering applications. No changes have been made in the basic synclinal design.

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Chicago, Wilmington and Franklin Orient Mine No. 3 preparation plant, equipped with R&S Super-Airflow units.

R&S FURNISHES AIRFLOW No. 6 FOR ORIENT No. 3



One of six Super-Airflow units for air-washing minus 3/16" stoker coal at C. W. & F. Orient Mine No. 3

One of the highlights of our incoming mail this summer was an order for a sixth Super-Airflow unit for installation at Chicago, Wilmington and Franklin's Orient Mine No. 3 preparation plant, illustrated above. We were doubly glad to get the order because it illustrated the satisfaction of C. W. & F. management with the five Super-Airflows that had been in operation dry cleaning minus 3/16" stoker coal in the plant since its completion in 1951.

Orient No. 3 is the third Airflow-equipped C. W. & F. plant . . . so you know that they have had ample opportunity to put Airflows to the test!

Whether you are like C. W. & F. and a growing list of other companies who have found air-washing the solution to some of their toughest preparation problems . . . or whether wet-washing or heavy media separation is the answer to your problem . . . you will find that Roberts & Schaefer Company is a reliable headquarters for competent, unbiased counsel.

Bulletin No. 175 tells the full Super-Airflow story. Copies available on request →



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COAL CRUSHING EQUIPMENT

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Single Roll Rockmaster Crusher for both primary and secondary crushing. Used in crushing mine refuse, sulphur balls, sand rock, slate, etc. *Bulletin RM-505.*

Single Roll Black Diamond Crusher with exclusive automatic steelstrut toggle and quick adjustment. *Bulletin BD-457.*

McLanahan Double Roll Crusher for various reductions of medium-size feeds. *Bulletin DR-447.*

The low cost McLanahan Bantam Buster Single Roll Crusher. *Bulletin BB-511.*

Backed by 117 years of manufacturing experience, McLanahan builds crushing equipment for the ultimate in economy through long service and minimum maintenance costs. This equipment, which has been thoroughly service-proven on the most demanding of domestic and foreign installations, is available in a great variety of sizes for every coal crushing requirement. A pioneer in the development of many types of crushing equipment—including the first single roll crusher produced in 1894—McLanahan is equipped to produce complete units, from feeders, primary and reduction crushers through elevators, sizing screens, etc.

WRITE FOR BULLETINS: Separate bulletins are available on all the crushers shown, and on a wide variety of other equipment.

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The most productive BLAST HOLE DRILLER



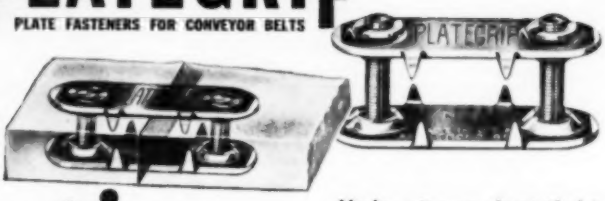
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● Time and again McCarthy Drills get the nod from operating men . . . men who've made actual tests proving that no other equipment can match a McCarthy for speed, stamina and versatility.

At the Bessemer Limestone and Cement Company, Bessemer, Pa., one McCarthy unit averages 9⅞ ft. per hr., working through a facing of blue shale 34 ft. deep. Holes are drilled on 18-ft. centers. Two men handle the whole job, including setup and moving. Another McCarthy unit has been installed in a different section of this quarry and it, too, is breaking all previous records for fast, low cost shot hole drilling. McCarthy Drills operate with all types of power units on all types of mounts. Write today for full facts about this finger-tip controlled money saver.

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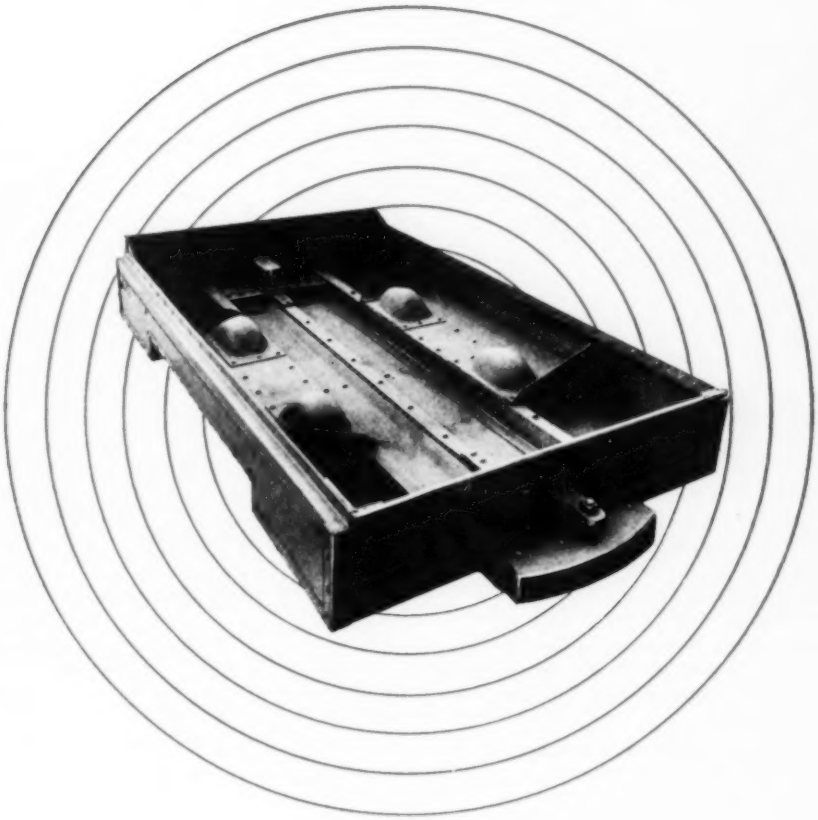
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FLAME-PROOFING of Upson-Walton dry-proofed brattice cloth does not depend on moisture, absorbed by chemicals. The chemicals used in treating Upson-Walton cloth flame-proof the cloth directly, and are not designed to absorb moisture for this purpose. Thus you can rely on this flame-proofing—under all conditions.

There are other advantages. Since it does not soak up moisture, Upson-Walton cloth weighs less. Grade for grade, weight is cut as much as 15%. This means easier handling and lower costs.

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USE KOPPERS PRESSURE-TREATED LUMBER!



Koppers Pressure-Creosoted Mine Ties, Supports, and Headers at Johnstown Coal & Coke Co., No. 2 Portage Mine, Portage, Pa.

● It's a good, sound investment to use Koppers Pressure-Creosoted Lumber wherever wood must serve under *severe* conditions. And that applies to almost every place in your coal mine.

Safer! . . . Cheaper!

Where *ordinary* wood just can't stand the gaff, Koppers Pressure-Treated Lumber retains its strength, is safer to use, and saves money by lasting so long. That's because this wood is pressure-treated, protecting it against rot, decay and termites.

Cut Replacement Costs!

Koppers Pressure-Treated Lumber cuts down repairs and does away with a great many costly replacements. It's not only used in ties, headers and supports as pictured here, but also in poles . . . stairways . . . air shafts . . . trestles . . . mine car bottoms.

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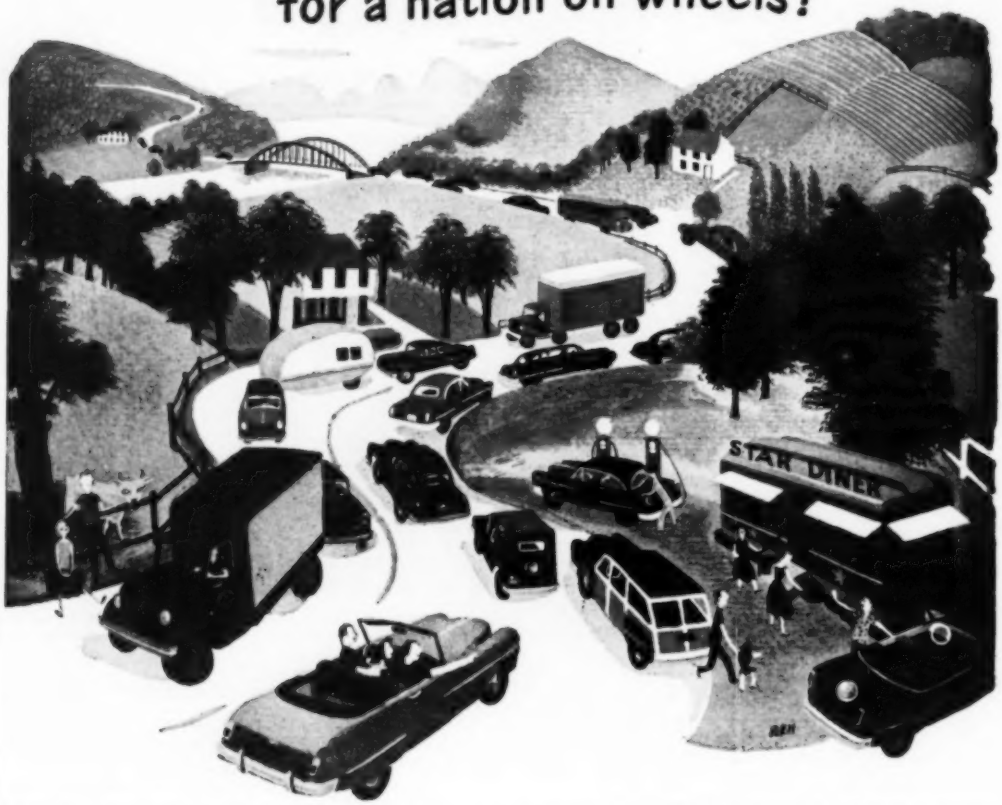
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Your tires turn on a road of coal, for it takes coal to manufacture highway cement and it's coal tar that binds and surfaces the crushed stone base of a "blacktop." Your car and the bridge it crosses are *bituminous* coal "products," too—both are made of steel and to make *every* pound of steel takes the carbon from a pound of coal. Even modern highway lighting depends on coal—70% of the fuel used by America's electric companies is coal. More than that, almost all the fine products that make our standard of living the world's highest depend on coal power for their manufacture!

So it's important to everyone that America's 5,000 competitive coal companies have developed the most efficient coal industry in the world . . . that America's coal resources are virtually inexhaustible!

Are you responsible for choosing the fuel to power a factory—to heat a home, a hospital or any other building? Then you should consider these important

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- ☆ **Vast reserves make coal's supply dependable!**
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- ☆ **A progressive industry strives to deliver an ever better product at the lowest possible price!**

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A Department of National Coal Association, Washington, D.C.

FOR ECONOMY AND DEPENDABILITY

YOU CAN COUNT ON COAL!

NEW Cedarapids Built by IOWA Schrock Motorized HEAD PULLEYS



SIMPLIFY EVERY BELT CONVEYOR AND BELT-BUCKET ELEVATOR INSTALLATION

IT'S COMPLETELY DIFFERENT FROM CONVENTIONAL CONVEYOR DRIVES

Everything is contained **INSIDE** the pulley!

ELIMINATES ALL MAINTENANCE ON SPROCKETS, CHAINS, JACK-SHAFTS, V-BELTS, ETC.

U. S. Pat. No. 2548299 Others Pending

WHAT A *Motorized* HEAD PULLEY IS

THIS is a revolutionary departure from the conventional types of conveyor drives. A *motorized* head pulley is a fabricated steel pulley with *everything*... electric motor, reduction gears and all moving parts . . . contained inside the drum! It's simply a new application of the long-proven gear reduction drive, and because of its simplicity, it's the answer to the maintenance man's prayer. 70% to 90% of conveyor down time is saved by eliminating all countershafts, speed reducers, sprockets, chains, Universal shaft drive and other parts necessary with conventional pulley drives. Motorized Head Pulleys are simple to install and flexible in use, completely interchangeable and adaptable to all types of belt and belt-bucket conveyor installations. By means of a simple adapter, a single pulley can be utilized in any of several belt locations, operating various widths of belt, or changing from larger or smaller horsepower. Pulley sizes range from 5 to 30 HP and are available in various widths. A Motorized Head Pulley is safe, because there are no sprockets, chains, jack-shafts, V-belts, etc. to endanger personnel. It's compact... requires no more room than a conventional pulley. Complete protection from weather, grit and dirt also reduces maintenance. Cedarapids Schrock Motorized Head Pulleys have been job-tested for many years under severest working conditions.

HOW IT WORKS

The pulley shell rotates about the electric motor, which is held stationary by means of a torque arm attached to the conveyor frame. The speed of the shell depends upon the combined reduction ratio of the various pinions and gears contained within the pulley shell. This reduction starts with a primary pinion mounted on the motor shaft and ends in the ring gear attached to the shell. The shell in turn then drives the conveyor belt. Leads to the motor enter the head pulley through a hollow conduit passing through the drum end bell and bearing. A simple oil bath gear compartment provides a lubricating bath for the reduction gears and front motor bearing. Motor and head pulley are cooled and ventilated by holes in the drum.

GET COMPLETE DETAILS TODAY

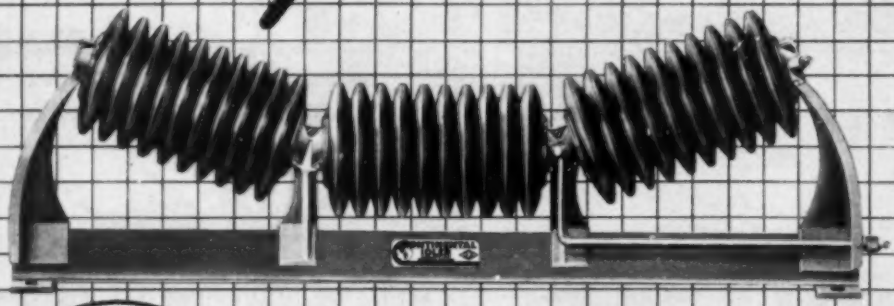
Find out all the advantages of converting your conveyor installations to motorized efficiency before you need head pulley replacements. One internationally known company has 50 Motorized Head Pulleys installed on widespread conveyor operations, and plans more for every installation that requires replacement. Get complete details about every feature. See your distributor today, or write direct to Iowa Manufacturing Company.

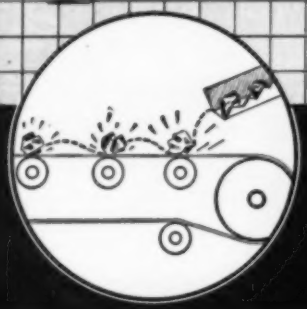
IOWA MANUFACTURING CO.
Cedar Rapids, Iowa, U. S. A.

Built for sale in Arizona, California, Idaho, Montana, Nevada, New Mexico, Oregon, Texas, Utah and Washington.

YUBA MANUFACTURING CO.
Pulley & Sprocket Dept., Benicia, California

Save your Belts!





Use CONTINENTAL IMPACT IDLERS

Continental Impact Idlers under the loading point of your Conveyors will reduce damage to the belt covering and prevent breakdown of the carcass, thus lowering your belt cost per ton of material handled.

The design of Continental's Rubber Disc Impact Idlers has been proved superior by laboratory tests. The discs are mounted on a steel roll equipped with Timken Bearings and having the same sturdy construction as Continental's Standard Idlers so far as bearings, shaft size and grease seals are concerned.

Send us your orders and inquiries. Literature available on request.

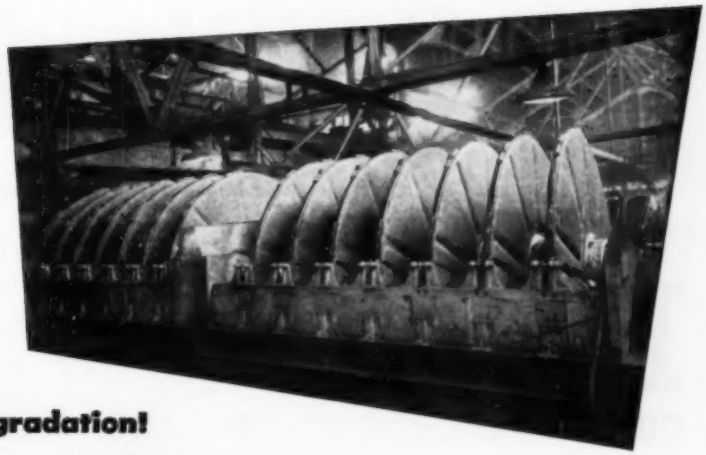


CG 1901

INDUSTRIAL DIVISION
CONTINENTAL GIN COMPANY
BIRMINGHAM, ALABAMA

ENGINEERS CGC ATLANTA • DALLAS • MEMPHIS • NEW YORK CGC MANUFACTURERS

DEWATERING FINE COAL



. . . without Degradation!

. . . with Clean Filtrate!

DO IT the American way. A play on words? Yes, but nowhere can you find a more effective, higher capacity unit for dewatering fine coal than the American Continuous Filter.

Better yet, nowhere can you find a unit which, considering the stream pollution problem confronting coal companies, will do what a real dewaterer is supposed to do: separate solids from liquids without letting the solids through in damaging percentages. Filtrate from the American Filter handling fine coal (⅛" and under) carries on the average less than 1% solids.

And best of all — you will find that all this effective dewatering takes place *without any degradation of product.* The coal is handled gently.

Bring your fines dewatering problem to Oliver United. We have laboratory facilities and field test units for determining the best filter station. And we have several types of dewaterers to complement the American where sizes are such as to call for a different filter.

New York 18 — 33 W. 42nd St. Chicago 1 — 221 N. LaSalle St.
Oakland 1 — 2900 Glascock St. San Francisco 11 — 260 Calif. St.
Export Sales Office — New York • Cable — OLIUNIFILT

FACTORIES:
Hazleton, Pa.
Oakland, Calif.

OLIVER UNITED FILTERS OUF INC. **inc.**

WORLD WIDE SALES, SERVICE AND MANUFACTURING FACILITIES

CANADA
E. Long, Ltd.
Orillia, Ontario

MEXICO & CENT. AMERICA
Oliver United Filters Inc.
Oakland, Calif.

INDIA
Dorr-Oliver (India) Ltd., Bombay

EUROPE & NORTH AFRICA
Dorr-Oliver S. A. Brussels
Dorr-Oliver S.N.a.R.L. Paris
Dorr g.m.b.h. Wiesbaden (16)
Dorr-Oliver Co., Ltd., London, S.W. 1
Dorr-Oliver S.a.R.L. Milano
Dorr-Oliver, N.V. Amsterdam-C

PHILIPPINE ISLANDS
E. J. Nell Co.
Manila

HAWAIIAN ISLANDS
Honolulu
A. R. Duvall

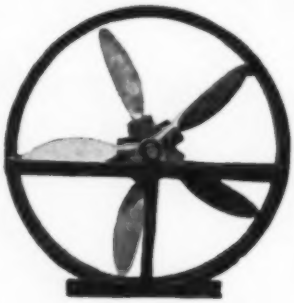
WEST INDIES
Wm. A. Powe — Havana

SOUTH AMERICA & ASIA
The Dorr Co.
Stamford, Conn.

AUSTRALIA
Hobart DuR Pty., Ltd.
Melbourne

SOUTH AFRICA
E. L. Bateman Pty., Ltd.
Johannesburg, Transvaal

GUYAN



Made in 4 sizes:
36", 48", 60" and 72".

VENTA-MINE

All have cast aluminum blades — 60" and 72" sizes have adjustable pitch.

FANS

Write for GUYAN Catalog

GUYAN MACHINERY CO. LOGAN, WEST VA.



AIRFLOW INDICATOR SWITCH

• Here's a dependable mercury tube type switch to be used with battery and bell to sound an alarm in the event of ventilating fan failure. Switch is also available for 110 or 220 volt A.C. and may be used with suitable light, bell or horn. . . . The switch is designed for installation in the exhaust air flow of fan. . . . Write for full descriptive bulletin.

GUYAN MACHINERY COMPANY
LOGAN, WEST VIRGINIA



3 N. & F. Silos at Corona Coal Co.'s Mine No. 3

These silos will hold approximately 275 tons of coal when filled. Trains of mine cars travel over the silos. As they move, each is automatically dumped, and the coal drops into the three silos. Photo is a rear view. A truck backs under a silo and is filled by pulling the gate lever.

This is the ideal method of handling coal at Corona's Mine No. 3. Situations are different at other mines, and we engineer storage systems accordingly. In many cases, we collaborate with makers of conveying machinery.

Due to the strength and endurance of Neff & Fry Silos, they have the hardihood to stand up under the rough treatment they get at coal mines.

Complete information will be gladly furnished. Write, wire, or phone us.

THE NEFF & FRY CO. • 228 Elm St., Camden, Ohio

SUPER-CONCRETE STAVE STORAGE BINS



A copy of this quick-reading, 8-page booklet is yours for the asking. It contains many facts on the benefits derived from your business paper and tips on how to read more profitably. Write for the "WHY and HOW booklet."

• • • • • • • • • • • • • •

McGraw-Hill Publishing Company, Room 2710, 330 West 42nd St., New York 36, N. Y.

ELIMINATES SHOCKS and BURNS

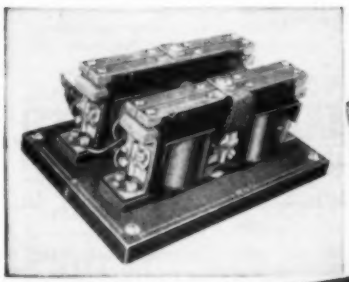
PROMOTES SAFETY

PROTECTS YOUR EQUIPMENT

ENTIRELY AUTOMATIC

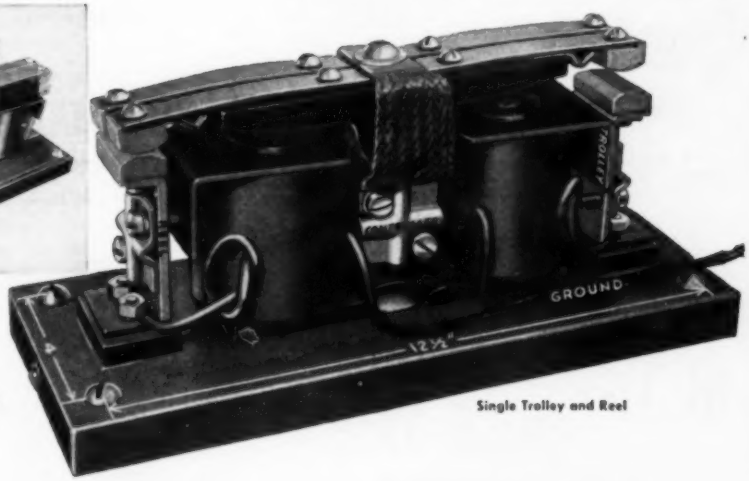
P-G AUTOMATIC **TRANSFER SWITCH**

SINGLE OR DOUBLE TROLLEY AND REEL



Double Trolley and Reel

Available in 250 to 600 Volts



Single Trolley and Reel

P-G Automatic Transfer Switches are designed for use on all types and makes of gathering locomotives.

Automatically transfers the current from trolley to reel, or vice-versa. Hand operated switches are eliminated.

Promotes safety—avoid shocks or burns to operator while changing from trolley to reel.

Simple in design, easy to install, requires very little space, and can be mounted anywhere. Furnished complete with cover.

Heavy duty coils provide for positive contact through double contact assembly. Contacts are easily renewable.

P-G

THE POST-GLOVER ELECTRIC COMPANY

•ESTABLISHED 1892•

221 WEST THIRD STREET, CINCINNATI 2, OHIO

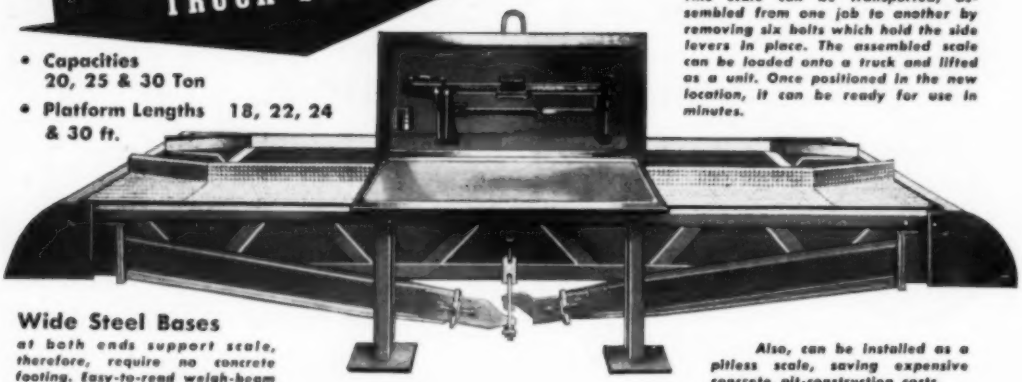
THURMAN PORTABLE TRUCK SCALE

THIS SCALE CAN BE MOVED FROM JOB TO JOB, AS A UNIT

- Capacities 20, 25 & 30 Ton
- Platform Lengths 18, 22, 24 & 30 ft.

Accurate and Portable

This scale can be transported, assembled from one job to another by removing six bolts which hold the side levers in place. The assembled scale can be loaded onto a truck and lifted as a unit. Once positioned in the new location, it can be ready for use in minutes.



Wide Steel Bases

at both ends support scale, therefore, require no concrete footing. Easy-to-read weigh-beam is chrome-plated. Other vital parts electro-plated against erosion.

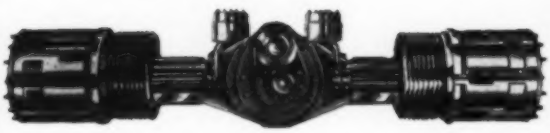
Also, can be installed as a pitless scale, saving expensive concrete pit-construction costs.

The Thurman Line Includes:

• Pit Scales up to 50-Ton capacity • Pitless Scales • Batching Scales • Liquid Weighing Scales • Wheelbarrow Scales • Warehouse Scales • This and other weighing equipment in sizes to fit your requirements

THURMAN MACHINE CO.
(Scale Division)
Established 1918
N. 5th Street, Corner of Lafayette, Columbus 15, Ohio

PIONEERS IN TRUCK ENGINEERING SINCE 1910



DART PLANETARY AXLE

ANOTHER FIRST WITH DART

The first mining truck built using a triple reduction axle. This means less strain on all axle parts and permits "Dart" to use more powerful engines. Double reduction gear carrier permits wide variance of final drive ratios to meet specific requirements. Five to one planetary gear reduction in each wheel reduces gear loads. 85,000 pounds conservatively rated capacity. TALK WITH DART ABOUT YOUR TRUCK PROBLEMS. YOU'LL GET SPECIALIZED SERVICE.

DART TONNAGE ENGINEERED TRUCKS

DART TRUCK CO. KANSAS CITY 8, MISSOURI

OVER 40 YEARS' EXPERIENCE IN BUILDING SPECIALLY ENGINEERED TRUCKS

Searchlight Can Help You!

HUNDREDS of miscellaneous business problems that confront you from time to time, can be quickly and easily solved through the use of the Searchlight Section of this or other McGraw-Hill publications.

The SEARCHLIGHT SECTION Classified Advertising of McGraw-Hill Publications

Can help you by bringing business needs of "opportunities" to the attention of other men associated in executive management, sales and responsible technical, engineering and operating capacities with the industries served by:

American Machinist
Aviation Week
Bus Transportation
Chemical Engineering
Chemical Week
Coal Age
Construction Methods & Equipment
Electrical Construction & Maintenance
Electrical Merchandising
Electrical World
Electronics
Engineering and Mining Journal
Engineering News-Record
E. & M. J. Markets
Factory Management and Maintenance
Fleet Owner
Food Engineering
Nucleonics
Power
Product Engineering
Textile World
Welding Engineer

The Searchlight Section is the classified advertising appearing in each of these papers. You can use it at small cost, to announce all kinds of business wants of interest to other men in the fields served by these publications. It is the regular meeting place of the man with a miscellaneous business need and the men who can fill that need.

When you want additional employees, want to buy or sell used or surplus equipment, want additional products to manufacture, seek additional capital, or have other miscellaneous business wants —advertise them in the Searchlight Section for quick, profitable results!

Classified Advertising Division

McGRAW-HILL PUBLISHING CO., Inc.
330 West 42nd Street New York 18, N. Y.



If you're stumped by high costs... low tonnage... thin profits...

Allen & Garcia can help you!

Any one of those problems unsolved in your business can put you OUT OF BUSINESS! But if *you* can't find a solution, then what? *Then it's time to turn your problem over to Allen & Garcia engineers.*

Professional mine engineering—from top to bottom, inside and out—is our exclusive business. A & G engineers are specially trained to locate trouble quickly and find ways to cut costs, raise tonnage and increase profits for small mines as well as the largest. Unencumbered by affiliation with *any* manufactured products, our recommendations are completely unbiased.

So if you find yourself stumped, call in Allen & Garcia without delay. Preliminary consultation is yours entirely without obligation.

SCOPE OF SERVICES

- Design and construction of new plants and their various units.
- Organization, operation and management of mines.
- Below ground modernization and mechanization.
- Reconstruction, revamping, or improvement of existing plants.
- General consulting work regarding power, equipment, operation, and various mining problems.
- Valuations for financing, fire loss, taxation purpose—reports and appraisals.

We work with undivided responsibility to you on a cost and fixed fee basis. We are not hampered by any connections which might prejudice the true professional engineering approach to your problem.

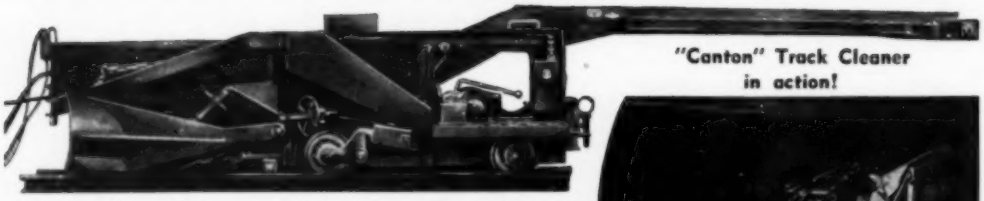
A&G



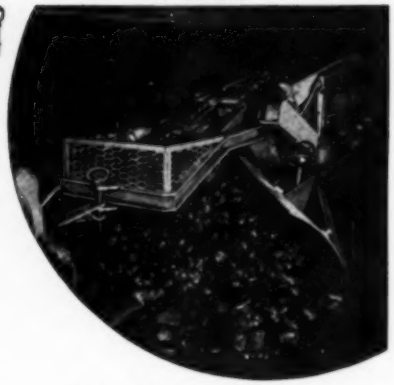
Allen & Garcia
COMPANY
Consulting and Constructing Engineers

332 S. MICHIGAN AVE., CHICAGO 4, ILL.
140 WALL ST, NEW YORK 5, N. Y.
LONDON, ENGLAND

Now . . . . Track Cleaning Cost is $ 0 Minus ! !



"Canton" Track Cleaner in action!



Tracks Cleaned at a Profit

Today, track cleaning is not a costly headache . . . it is a pleasant, profitable operation. No track workers to get hurt. Clean tracks once thoroughly with the Canton Track Cleaner. Then subsequent cleanings yield good coal. Load cars higher, haul more tonnage. Reclaim spillage mechanically. Write us for name of nearest mine where you can make inspection.

Performance Records . . .

893 three-ton cars, on time and one-half, were loaded with machine at a cost of $.462 per ton. Hand loading (estimating five 3-ton cars per man per shift) would cost $1.31 per ton. Total cost at $19.575 per shift for 893 cars with machines — $1237.70. Same number of cars, hand loading, would cost — $3509.49. Would the saving of $2271.79 have any effect on your cost per ton of coal? Another company loaded 887 tons at a cost of $.465 per ton cleaning 27860 ft. of track at $.015 per foot. (Names on request.)

Write for complete data. Please use street and zone numbers.

Write us what your track cleaning costs are and how many miles of track you clean, and we will show you how much extra profit you can make with a "Canton" Track Cleaner, after it has paid for itself.

American Mine Door Company

2057 Dueber Ave. • • Canton 6, Ohio

Mechanical Track Cleaners • Automatic Doors • Dustributors • Car Transfers • Automatic Switch Throws
Cable Splicers and Vulcanizers

"Sutton SAND DRYING STOVES

The Standard for Over Forty Years

Burns Any Type of Fuel

The "Sutton" Sand Dryer may be fired with any type of fuel. While most "Sutton" Sand Dryers are equipped to burn coal, they can be furnished with burners for natural gas or fuel oil.



"SUTTON" FEATURES

- Simple in operation
- No skilled labor necessary
- Made in four sizes
- Lowest original cost
- Economical upkeep
- Topmost efficiency

SATISFACTION GUARANTEED

Catalog and Prices sent upon request

INDIANA FOUNDRY COMPANY

950 Oak Street Indiana, Pa.

At Your Service

—for bringing business needs or "opportunities" to the attention of men associated in executive, management, sales and responsible technical, engineering and operating capacities with the industries served by the following McGraw-Hill publications:

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(Classified Advertising)

American Machinist
Aviation Week
Business Week
Bus Transportation
Chemical Engineering
Chemical Week
Coal Age
Construction Methods & Equipment
Electrical Construction & Maintenance
Electrical Merchandising
Electrical Wholesaling
Electrical World
Electronics
Engineering and Mining Journal
Engineering News-Record
E. & M. J. Markets
Factory Management and Maintenance
Fleet Owner
Food Engineering
Nucleonics
Power
Product Engineering
Textile World
Welding Engineer

For advertising rates or other information address the

Classified Advertising Division

McGraw-Hill Publishing Co., Inc.

330 W. 42nd Street New York 18, N. Y.

CHUTE THE WORKS

Keep Coal Unfrozen

with

WYANDOTTE
CALCIUM CHLORIDE

Wyandotte

Wyandotte Chemicals Corporation, Wyandotte, Michigan

LUBRICATION ECONOMY

LUBRIPLATE LUBRICANTS
Cut Parts Replacements
50%



The Northern Pacific Transport Company writes us:— "*Since using LUBRIPLATE Lubricants, our overhaul periods are stretched from 50,000 to 100,000 miles, and repair parts bill cut 50%.*" LUBRIPLATE Lubricants will show you startling savings in parts and increased production.

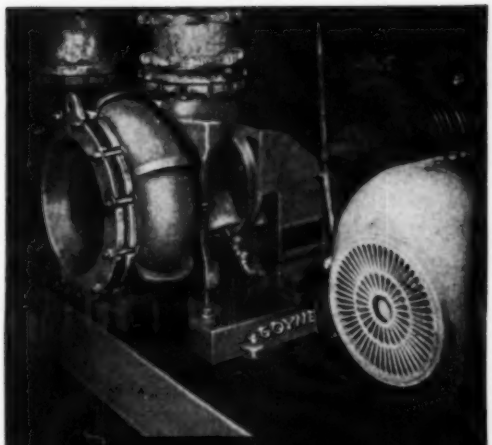
1. LUBRIPLATE reduces friction and wear
2. LUBRIPLATE prevents rust and corrosion
3. LUBRIPLATE is economical to use

Write today for case histories of savings made through the use of LUBRIPLATE in your industry.

LUBRIPLATE DIVISION
Fiske Brothers Refining Co.
Newark 5, N. J. Toledo 5, Ohio

The Different LUBRICANT!

DEALERS EVERYWHERE, consult your Classified Telephone Book



GOYNE
SOLIDS HANDLING PUMP

Feature:
LOW-COST OPERATION

GOYNE SOLIDS HANDLING PUMPS are extremely popular with a very large number of coal companies who find them quite reliable for pumping:

Liquids with solids added to increase specific gravities for coal and refuse separation in coal preparation plants.

Disposing of refuse and silt by pumping to waste material banks or for back filling into mined out areas.

Pumping prepared coal to temporarily desired storage areas.

These specially designed Goyne pumps incorporate numerous features to reduce upkeep and labor maintenance costs to a minimum:

1. Ease of inspection of all wearing parts. All internal portions are immediately accessible after removing ***only the rear head of the pump.*** No suction or discharge piping or any other major part of the pump is disturbed.

2. The only packing box of the pump is subjected to the low suction pressure rather than to the discharge pressure developed by the pump. This feature assures long packing and shaft sleeve life.

3. Impeller clearance is adjusted while the pump is running, insuring constant pump capacity so essential for uniform washing.

4. There are twenty-eight possible nozzle assembly combinations for each standard pump. Washery designers like this "adaptability feature" as it helps them out of tight places and simplifies piping.

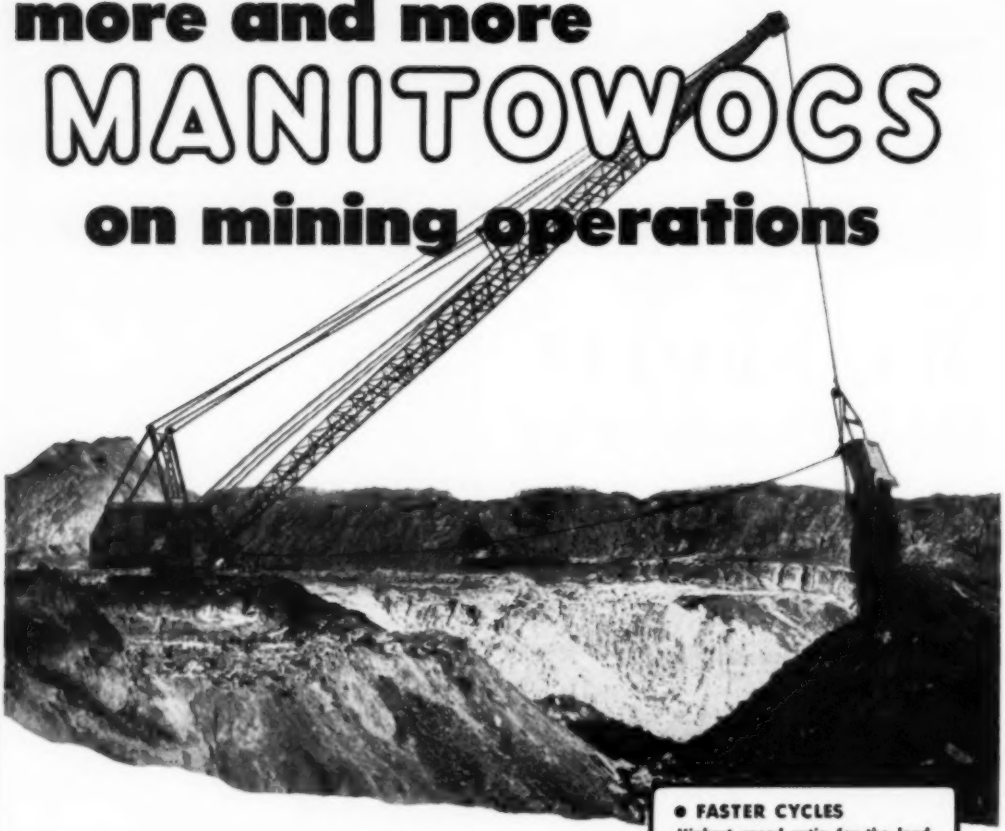
5. Spare parts are carried in stock at our plant for prompt shipment. Reduce your inventory by using Goyne Process Pumps.

All inquiries are given a thorough engineering analysis and our prompt attention.

GOYNE MINE PUMPS 1881

The GOYNE STEAM PUMP CO.
ASHLAND, PA.

more and more MANITOWOCS on mining operations



There's a big swing to Manitowoc excavators on every phase of mining — from stripping to loading — because Manitowocs are built for these jobs — with special long-reach dragline booms; long "hi-lift" shovels; large, wide crawlers; built-in stability — all the factors that contribute to big, steady output.

From the Mesabi Iron Range, to the coal fields of Pennsylvania, Manitowocs are becoming first choice of the experienced operators—those who've tried them all are switching to Manitowocs, and the repeat orders reveal their satisfactory performance. Before you buy your next machine, get complete details on Manitowoc Mining Shovels, Cranes, and Draglines. Manitowoc Engineering Works, Manitowoc, Wisconsin.

- **FASTER CYCLES**
  Highest speed ratio for the load, automatically selected. Speeds increased as much as 25% with complete safety for machine and operator.
- **FULL ENGINE POWER**
  Engine never lugged down below full speed load — Converter boosts torque, increases bail pull, without pulling down engine speed.

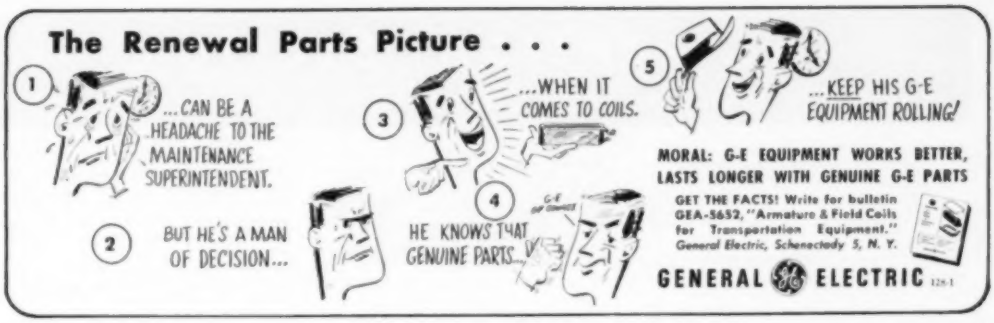
THE TORQUE CONVERTER makes the difference

- **ABSORBS SHOCK**
  Oil cushion absorbs shock loads . . . reduces machine breakage, assures longer parts life and less down time for maintenance.

MANITOWOC Speedcrane

SHOVELS 1-5 YD. CRANES 18-100 TON

The Renewal Parts Picture . . .



MORAL: G-E EQUIPMENT WORKS BETTER, LASTS LONGER WITH GENUINE G-E PARTS

GET THE FACTS! Write for bulletin GEA-5652, "Armature & Field Coils for Transportation Equipment." *General Electric, Schenectady 5, N. Y.*

GENERAL ELECTRIC 128-1

after you've read this magazine

. . . and clipped pertinent ideas, articles and advertisements for reference, *please do not burn or throw it away.*

Here are two sound reasons why:

1) Wastepaper can help to swell the funds of your local Boy Scout Troop, your church or other community organization. It gets a good price these days.

2) Whether in magazine form or not, wastepaper helps to fill the increasing need for paper pulp brought on by the mobilization effort.

Collect it. Give it to your favorite organization. Chances are they have scheduled pickups.

CORE DRILLING
—anywhere

"We look into the Earth"

PENNSYLVANIA Drilling CO.

DRILLING CONTRACTORS AND MFRS.

1205 Chartiers Ave. Pittsburgh, Pa. WAlnut 1-5816

FASTER — EASIER
Corrosion Proof Piping
with
PLASTEX

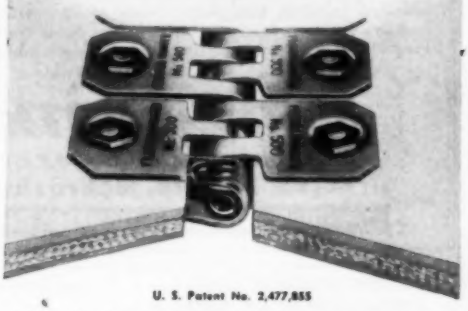


The extreme lightweight and flexibility of PLASTEX pipe makes it ideal for use in irregular mine passages. Coils up to 400 ft. can be put in operation in a few minutes without special tools or handling equipment. PLASTEX far outlasts ordinary pipe because it is guaranteed against rust, rot and electrolytic corrosion. The smooth surface stays clean and free from scale assuring greater flow and trouble-free performance.
Ask your supplier for PLASTEX mine pipe—or write for specifications.

The PLASTEX Pipe & Extrusion Co.
402 Mt. Vernon Ave., Columbus 3, Ohio

PLASTEX P PIPE
CORROSION PROOF

. . . the new separable
FLEXCO HINGED
BELT FASTENERS



U. S. Patent No. 2,477,855

- For joining grader, trencher, ditcher and other earth moving conveyor belts.
- For belts 3/16" to 1/2" thick.
- A FLEXCO fastener that is HINGED. Has removable hinge pin.
- Troughs naturally, operates through take-up pulleys.
- Strong, durable . . . pull or tension is distributed uniformly across joint.

Order From Your Supply House. Ask for Bulletin HF 500.

FLEXIBLE STEEL LACING CO
4638 Lexington St., Chicago 44, Ill.

CLASSIFIED SEARCHLIGHT SECTION ADVERTISING

EMPLOYMENT • BUSINESS • OPPORTUNITIES • EQUIPMENT—USED or RESALE

UNDISPLAYED RATE:
$1.20 a line, minimum 3 lines. To figure advance payment count 5 average words as a line.
POSITION WANTED & INDIVIDUAL SELLING OPPORTUNITY undisplayed advertising rate is one-half of the above rate, payable in advance.
PROPOSALS, $1.20 a line an insertion.

INFORMATION:
BOX NUMBERS care of publication count as 1 line additional.
DISCOUNT OF 10% if full payment is made in advance of four consecutive insertions of undisplayed ads (not including proposals).
EQUIPMENT WANTED OR FOR SALE Advertisements acceptable only in Displayed Style.

DISPLAYED RATE:
The advertising rate is $9.25 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request. AN ADVERTISING INCH is measured ⅞ inch vertically on one column, 3 columns—30 inches to a page. C.A.

NEW ADVERTISEMENTS: Address N.Y. office, 330 W. 42 St., N.Y. 36, for November issue. Closing October 20th

AN AUCTION

COAL BRIQUETTE PLANT EQUIPMENT & REAL ESTATE

FORT SCOTT, KANSAS

MONDAY, OCTOBER 20, 1 P. M.

The equipment will be offered piece by piece and then offered as a whole, a complete plant, and then the real estate will be sold. The plant is located at 801 Ivy Street, Fort Scott, Kansas; Fort Scott is about 95 miles South of Kansas City; Unloading conveyor, track, drag type, unloader 2'x28'x3", complete; elevator to hopper, complete; 5'x30' rotary dryer, complete; 30"x46"x21'9" bucket type elevator from dryer to crusher; Type WC 30x40x40 coal pulverizer, 40 ton per hr cap; elevator from crusher to mixer, complete; 3'x4'x38' Pug mill type mixer, 60 ton per hr cap, complete; belt conveyor from mixer to press, complete; #16 rotary type briquette press, 30 ton per hr cap, Webb briquette press complete; Hercules diesel 6 cyl, 215 hp, 1800 rpm power unit; 3 cooling conveyors, outside, all steel, complete; 6x6' steel asphalt storage tank, complete; other asphalt tanks; Broderick Mfg. steam boiler, complete; 1135' 90 lb RR rails; box car; portable unloading conveyor; many extra electric motors; car mover; R-5 Cat tractor; Inspect the equipment or real estate at any time; plant was installed in 1946, equipment ready to run; write, wire or call auctioneers for complete sale bill; in Fort Scott contact Mr. H. D. Cole, Ph 2891; much of this equipment is very adaptable for other uses.

H. D. Cole & I. L. Graves, Owners

FORKE BROTHERS
the Auctioneers
321 Sharp Bldg. **Lincoln, Nebraska** Phone 2-7045
— EQUIPMENT AUCTION LEADERSHIP SINCE 1921 —

REPLIES (Box No.):
Address to office nearest you
NEW YORK: 330 W. 42 St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

Selling Opportunity Offered

WANTED—SALESMAN—Sales Engineer, experienced in coal mining field sales, age preferably 35-45, whose education, performance and ability will subsequently warrant promotion to Assistant Sales Manager, Mining Divison. Knowledge of coal cutting tools desirable. Salary and bonus. SW-5239, Coal Age.

Position Wanted

PUBLICITY-PUBLIC RELATIONS — 20-yr. coal background U.S. and Europe. Writer, speaker, editor. Close-up knowledge labor, Social problems, Age 47, married, children. Will travel. Resume available. PW-5490, Coal Age.

Business Opportunity

Strip Coal Wanted
Lease or purchase—large or small tracts. Morgan Coal Company, 2830 North Meridian Street, Indianapolis 8, Indiana.

Now on Sale
"OUR CHRISTMAS DISASTER"

The story and the record of New Orient Mine Explosion December 21, 1951

Generously illustrated with pictures and maps.

By Mail Post-paid $2.00 per Copy.
C. Edwin Hair
Box 62, Benton, Illinois

FOR SALE OR LEASE
BAKERSTOWN SEAM
FREEPORT SEAM
KITTANNING SEAM
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TUNNELTON, W. VA.

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30'6" Boom, 27'6" Square Stick
OFF LORAIN 820
Can be used on Lorain 79-80-82-820)
Used app. 4 months—like new
Replacement price $15,000 SACRIFICE $7500
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1—Jeffrey Aerodyne Exhaust Fan, Type 8-H-80 Serial #8638, complete with 75HP Wbse motor and 75HP Gasoline engine w/ automatic control.
1—Westinghouse Ignitron Rectifier, 300 KW. Serial #1-36P225, 3 car.
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Owner—Farland Fuel Corporation

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3—AIR COMPRESSORS
3—2000 to 3000 FT. CAP.
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Goodman 512 cutting machs. & extra trunks bargain
Jeff. L 600 & 400 Loaders —— Haiss cat. loader
Jeff. 35 B & BB & Good. Univ. Machs. DC & AC
Myers Whaley load. & Joy 6 BV & 14 BV loaders
Joy 7 J & T 2 cat. trucks—Joy Elev. Conv. PL 11
GMC 75 KW Diesel Gen. complete—Joy KMC 31" shuttle C.
Try STEELTITE Compound for Coal Dust Control — Sprays 75% more effectively than water alone.
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FOR SALE
1—Joy 20", 20 HP, 230 Volt DC Chain Conveyor with 300' pan line, remote controls, etc.
1—Tandem Head 26" Jeffrey Belt Conveyor with 25 HP DC motor, speed reducer, controller, with 1000' of intermediate sections with rollers.
1—60 HP, 6 cycle Hill Diesel Engine.
E. & S. Coal Company, Hillsdale, Pa., phone Johnstown 371515, or evenings Glen Campbell 4284.

LOCOMOTIVES

4—10 ton Atlas, battery, 36" ga.
2—8 ton Goodman, battery, 36" ga., permissible type
2—8 ton General Electric, battery, 36" ga.
2—7 ton General Electric, battery, 36" ga., permissible type
3—6 ton Ironton, battery, 36" ga.
1—6 ton Atlas, battery, 36" ga.
1—4 ton Atlas, battery, 36" ga.
1—4 ton Mancha, battery, 24" ga.
1—2½ ton Jeffrey, battery, 36" ga.
1—2 ton Whitcomb, battery, 24" ga.
1—4½ ton Goodman, Trolley, 36" ga.
1—5 ton Jeffrey, trolley, 36" ga.
1—6 ton Goodman, trolley, 36" ga.
1—3 ton Whitcomb, gasoline, 24" ga.

COAL CRUSHERS

1—24" x 24" Jeffrey Single Roll
1—24" x 36" McNally-Pittsburg Double Roll
1—30" x 45" Jeffrey Single Roll
1—30" x 16" Williams Pulverizer
1—36" x 40" Jeffrey Double Roll.
1—36" x 48" Jeffrey Hammermill

TUGGER & SLUSHER HOISTS

2—5 HP Brownie Room Hoists
3— 5 HP Sullivan RH single drum Room Hoists
1—7½ HP Sullivan double drum Slusher Hoist
2—10 HP Sullivan 3 drum Slusher Hoist
1—25 HP Sullivan 2 drum Slusher Hoist

ELECTRIC HOISTS

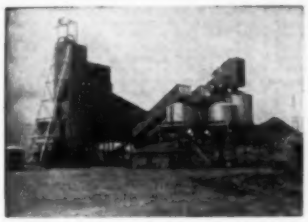
1—11 HP Vulcan #0 single drum
1—20 HP Vulcan single drum
1—22 HP Vulcan double drum
1—25 HP Vulcan single drum
1—30 HP Vulcan single drum
1—37 HP single drum
5—50 HP single drum
2—60 HP single drum
4—100 HP Box single drum
1—112 HP Vulcan single drum
1—145 HP Vulcan single drum
2—150 HP Vulcan single drum
1—375 HP Box single drum
1—600 HP Box single drum

BOX CAR LOADERS

2—Ottumwa 20 HP Box car loaders
3—Maniere 22 HP Box car loaders
1—Jeffrey 20 HP Box car loader

MINING MACHINES

2—7B Sullivan super short wall coal cutters
18—CE7 Sullivan coal cutters
1—CR3 Sullivan coal cutters
1—Jeffrey 28A coal cutter
6—Goodman 112-A coal cutters
1—Sullivan CH-11 ironclad shearing machine
1—Jeffrey 29-C Arcwall coal cutter



LOADERS & CONVEYORS

2—8BU Joy loaders
2—61EW Jeffrey elevating chain conveyors
1—61HG Jeffrey chain conveyor, 90'
1—61W Jeffrey chain conveyor, 200'
9—G-20 Goodman shaker conveyors
10—G-15 Goodman shaker conveyors
8—Vulcan shaker conveyors
2—Joy ladel UN-17 shaker conveyors
10—Goodman HA duckbills

MINE FANS & BLOWERS

2—8-H Jeffrey 42" Aerodyne Fans
1—Jeffrey 8 x 4 Fan
5—Jeffrey A61 exhaust blowers
6—Jeffrey Aerodyne midget permissible blowers
3—Jeffrey Aerodyne midget blowers

SCALES

1—100 ton Fairbanks railroad scale
1—100 ton Howe railroad scale
1—125 ton Howe railroad scale
1—20 ton Fairbanks springless dial type truck scale
1—5000# Fairbanks Tipple scale with weighing basket
1—5000# Howe Tipple scale

STORAGE BINS

3—50 ton capacity steel bins
2—100 ton capacity steel bins

TIPPLE EQUIPMENT

1—4 deck shaker screen 32' long in 2 sections, driven by 10 HP & 25 HP motors
1—4 deck card shaker screen, 18' long, driven by 50 HP motor
1—Card rotary car dumper
1—Link Belt bucket elevator, 50' centers, 18" x 10" x 9" buckets
1—Link Belt bucket elevator, 50' centers, 10" x 6" x 6" buckets
1—Link Belt bucket elevator, 60' centers, 6" x 4" x 4" buckets
1—Jeffrey picking table, 19' centers, 36" wide
1—Jeffrey picking table, 19'8" centers, 36" wide
1—Jeffrey Drag Conveyor, 88'6" centers, 36" flights
1—Jeffrey Drag Conveyor, 72' centers, 30" flights
1—Jeffrey Drag Conveyor, 67' centers, 30" flights
1—Jeffrey Drag Conveyor, 69'6" centers, 28" flights
1—Link Belt Drag Conveyor, 50' centers, 15" flights
1—32" x 9'6" Card vibrating screen
1—4' x 6'6" Link Belt jig washer
1—Loading boom, 32'3" centers, 24" flights with 8' grizzly
1—Loading boom, 55' centers, 48" flights
1—Loading boom, 45' centers, 30" flights
2—Card self dumping mine cages
2—Card 84" bicycle sheave wheels
1—24" Belt conveyor, 40' centers
1—24" Belt conveyor, 13' centers
1—24" Belt conveyor, 135' centers
1—24" Belt conveyor, 66' centers
1—30" Belt conveyor, 173' centers
1—Red Devil egg loader, 16" flights
1—Ottumwa nut loader, 16" belt

ELECTRIC CABLE

12400#—weatherproof single conductor wire, 350000 CM
3600'—300000 CM wire
16600'—#4 rubber covered single conductor, 600V
3800'—#5 Parkway cable, 3 con., 7200 volt
2977'—#8 Parkway cable, 3 con., 7200 volt
1368'—#10 Parkway cable, 3 con., 7200 volt
547'—#2 3-conductor Tirex, 600 volt
3400'—#6 3 con., Tirex, 600 volt
1000'—#12 4-con., Tirex, 600 volt
12700'—1/0 rubber covered 1 con., 600 volt
3842#—#2 solid bare copper hard drawn
1725#—#4 solid bare copper hard drawn
6000'—1/0 solid bare copper hard drawn

PIT CARS

125—60 cu. ft. Card steel coal mine cars, 36" ga.
88—66 cu. ft. Card steel coal mine cars, 36" ga.

SHUTTLE CARS

2—Joy Shuttle Cars, Model 42DS.

RAIL

16, 20, 30, 40, 52, 60, and 80# relaying rail in stock

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2 complete tipple buildings and machinery, each capable of 1000 to 1500 tons per day production

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2900 BRIGHTON BLVD. **EST. 1898** **DENVER 1, COLO.**

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1—500 KW G.E. Syn. 275 V. 900 RPM
1—400 KW G.E. Syn. 575 V. 720 RPM
1—300 KW G.E. Syn. 275 V. 1200 RPM
2—300 KW WEST. Syn. 275 V. 1200 RPM
1—300 KW RIDGWAY Syn. 275 V. 1200 RPM
1—200 KW G.E. Syn. 275 V. 1200 RPM
1—200 KW RIDGWAY Syn. 275 V. 900 RPM
1—150 KW WEST. Syn. 275 V. 1200 RPM
1—100 KW RIDGWAY Syn. 275 V. 1200 RPM

ROTARY CONVERTERS

2—500 KW G. E. Syn. 275 V. 1200 RPM
1—500 KW WEST. Syn. 275 V. 1200 RPM
1—300 KW G. E. Syn. 275 V. 1200 RPM
1—300 KW WEST. Syn. 275 V. 1200 RPM
2—300 KW Al-Ch. Syn. 275 V. 1200 RPM
1—200 KW G. E. Syn. 275 V. 1200 RPM
1—150 KW G. E. Syn. 275 V. 1200 RPM
1—150 KW WEST. Syn. 275 V. 1200 RPM

NEW G. E. RECTIFIER

1—200 KW G.E. Sealed Ignitron Rectifier, Mining Stationary Type, 2300/4000 V. AC, 275 V. DC. Complete with AC Switchgear Cubicle, Rectifier Cubicle and DC Switchgear Cubicle. Equipment is throat connected to the main 225 KVA Rectifier Transformer. Rectifier Model #6RP40CAA30. Complete with water and air heat exchangers. Power Transformer and all other necessary accessories. Unit has never been in service.

LOCOMOTIVES

2—30 T JEFFREY 250 V. 3-MH-77, 48-36" Ga.
1—25 T G.E. 500/250 V. 3-HM-824-A, 44-36" Ga.
1—20 T JEFFREY 250 V. MH-77, 48-36" Ga.
1—20 T G.E. 250 V. (Tandem) HM-809, 36" Ga.
1—13 T JEFFREY 250 V. MH-110, 48-36" Ga.
1—13 T JEFFREY 500 V. MH-110, 48-36" Ga.
1—10 T JEFFREY 250 V. MH-2110, 48-36" Ga.
2—10 T JEFFREY 250 V. MH-110, 42-30" Ga.
1—10 T WEST. 250 V. ML-907-C 36" Ga.
2—10 T GOODMAN 250 V. 38-B, 36" Ga.
2— 8 T JEFFREY 250 V. MH-100, 42-36" Ga.
2— 8 T WEST. 250 V. ML-906-C, 44-36" Ga.
1— 8 T WEST. 250 V. ML-925-LK, 24" Ga.
2— 6 T JEFFREY 250 V. MH-98, 44-36" Ga.
2— 6 T JEFFREY 500 V. MH-88, 44-36" Ga.
2— 4 T GOODMAN 250 V. MB-4-E, 36-24" Ga.

LOCOMOTIVE MOTORS

2—JEFFREY 250 V. MH-77, Ball Bearing
2—WEST. 250 V. ML-908-C, Ball Bearing
2—WEST. 250 V. ML-906-C, Ball Bearing
2—WEST. 250 V. ML-904-H, Ball Bearing
2—G.E. 500/250 V. HM-824-A, Ball Bearing
4—WEST. 80 V. Y-49-X, Ball Bearing
Extra Armatures Available for Above Motors

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A Quarter of a Century Serving Mining and Industrial Companies

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CAR DUMP: Will dump 60 ft. standard railroad cars, with 3 hoppers, 3 phase, 60 cycle, 440 volt motors.

TRUCK CRANE: Lorain model MC824, 45 ton capacity, 100 ft. boom, 25 ft. jib and hook, diesel powered, weight 145,000 lbs. Used six months. For sale or rent. New condition.

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3500 Manitowoc with 45' Boom
34' Stick—2 cu. yd. Dipper
Caterpillar D-17000 Engine
1948 Model!
Good Condition! Good Value!

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MOTOR GENERATOR SETS

750 KW Al.Ch. 250 v. 720R-Syn. 2300/440 v.
400 KW West., 550 v. 720R-Syn.-SK 2300/4000 v.
2—300 KW West., 275 v. 1200R-Syn. 2300 v.
300 KW G.E. 275 v. 1200R-MPC-ATI 2300/4000 v.
300 KW Ridg. 275 v. 1200R-Syn. 2300 v.
300 KW West. 550 v., 1200R-Syn.-SK. 2300 v.
250 KW West. 275 v. 1200R-SK. CW 2300 v.
200 KW G.E. 275 v. 1200-MPC-ATI 2300/4000 v.
200 KW Ridg. 275 v. 900R-Syn. 2300 v.
200 KW West. 275 v. 900 R. SK. Syn. 2300 v.
200 KW G.E. 125 v. 1200 R MPC-ATI 2300/4000 v.
150 KW G.E. 275 v. 1200 R. MPC-ATI 2300/4000 v.
150 KW West. 275 v. 1200R-Syn.-SK 2300 v.
150 KW G.E. 550 v. 900 vR-DLC-ATI 2300/4000 v.
100 KW Ridg. 275 v. 1200R-Syn. 2300 v.
100 KW Burke 250 v. 900 R-Syn. 220 v.
35 KW G.E. 125 v. 1750 R. NC-KT 220/440 v.
15 KW Ideal 125 v. 1750R. D-A 220/440 v.

ROTARY CONVERTERS

500 KW West. 275 v. 1200 R. 2200/4000
2—500 KW G.E. 250 v. NCC6-1200R. 13,200 v.
400 KW West. 250 v. 1200R. 13,860/2200/4000
2—300 KW Al.Ch. 275 v. 1200R. 2200/4000 v.
300 KW G.E. 275 V. NC12-600 R. 2200/4000
200 KW G.E. 275 v. NCC6-1200R. 2200/4000 v.
150 KW G.E. 275 v. NCC6-1200R. 2200/4000 v.
150 KW West. 275 v. 1200R. 2200/4000 v.
Will rewind transformers to your specifications.

LOCOMOTIVES AND CUTTING MACHINES

20 Ton Jeff 250 v. 44" Ga. MH77
13 Ton Jeff 250 v. 36/48" Ga. MH110
10 Ton Jeff 250 v. 36/48" MH110
8 Ton Goodman 250/550 v. 42"/44" ga.
6 Ton Westgh. 250 v. 36" Ga. 904
2—6 Ton G.E. 250 v. 28½" ga.
5 Ton Greensburg Bat. Loco.—Philco Bat.
4—5 Ton Goodman 30B 250 v. 42/44"
35 B Jeff. 250 v. Permissible
12 G3 Goodman Shortwall 220/3/60
35 BB Jeff. A.C. permissible
3—12A Goodman Shortwall 50HP Motor 250 v.

AC MOTORS

HP	MAKE	SPEED	TYPE	WDG.
400	G.E.	450	IM	S.R.
300	G.E.	450	WT	S.R.
150	G.E.	600	ATI	Syn.
2—100	G.E.	450	IM	S.R.
100	West.	900		Syn.
100	West.	1200	CS	S.C.
75	West.	900	CS	S.C.
50	G.E.	1750	KT	S.C.
50	G.E.	900	KT	S.C.
40	G.E.	900	WT	S.R.
30	G.E.	900	KT	S.C.
30	G.E.	1200	KT	S.C.
20	West.	1200	CS	S.C.
15	West.	1750	CS	S.C.

Many smaller units in stock.

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(Est. 1919)
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NEW MOTORS "X-PROOF"

AC 3/60/220-440, Hi-Torque

9-15	HP	WEST.	FR. 356	1750 RPM
4-20		WEST.	364	1750 RPM
3-25		WEST.	405	1750 RPM
8-25		G. E.	365	352 G. Hd.
4-40		WEST.	444	1750
1-60		WEST.	504S	1750

DIRECT CURRENT 230V.

4- 5	HP	WEST.	254	1750 TEFC
8- 5		REL.	9-J-3	1750
4- 7½		WEST.	284	1750
9- 7½		REL.	14T	1750 Sp./Pr.
6-10		WEST.	SK43.9	1750
9-15		WEST.	63.9	1750
5-20		WEST.	93	1750 TEFC
1-25		WEST.	183	1150 TEFC
2-40		WEST.	91	1750

DIRECT CURRENT 550 Volts

4- 5	WEST.	SK254	1750
9-15	WEST.	63	1750 SP./Pr.
5-15	WEST.	63.9	1750
1-15	WEST.	63.9	1150
1-15	WEST.	63	1150 SP./Pr.

25% to 50% Disc. from Wholesale

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1—14BU-7A Joy Loader, 250 Volts. Good Condition.
1—8BU Joy Loader, 250 Volts. Rebuilt.
1—12BU Joy Loader, 250 Volts. Good Condition.

SHUTTLE CARS:
1—5BC Joy Shuttle Car, Cable Reel, 250 Volt.
2—3ZE Joy Shuttle Cars, Cable Reel, 250 Volt.
2—4ZD Joy Shuttle Cars, Battery, Rebuilt.
4—3ZD Joy Shuttle Cars, Battery, BARGAIN.

CUTTING MACHINES:
2—7AU Sullivan Universal, Track Mounted, 250 Volt.
1—29U Jeffrey Universal, 250 Volt.
2—35B or BE Jeffrey Shortwalls, 250 Volt — with or without truck. Rebuilt.

WE HAVE:
Motors, Crushers, M. G. Sets
Locomotives, Transformers, Conveyors
Send Us An Inquiry — Compare Our Prices

TIPPINS MACHINERY CO.
Pittsburgh 6, Penna.

NEW and REBUILT STORAGE BATTERY

LOCOMOTIVES

1½ to 10 Tons 13" to 54" Track Gauge.
GREENSBURG MACHINE CO.
Greensburg Pa.

WORLD'S LARGEST INVENTORY



FOR SALE
New 500 Gal. Skid Mounted
STORAGE TANKS
Shell of ¼" Steel, 2" Outlet and 12" Manhole in Top.
LEFTON INDUSTRIAL CORP.
212 Victor Street, St. Louis (4) Mo.

Ironton Electric Locomotives
New and used.
The Ironton Engine Company
Farmingdale, New Jersey

EQUIPMENT FOR SALE

LIST #8652

1—Vulcan Shaft Hoist, complete with 350 H.P., Motor, control equipment. Complete description furnished on request.
1—200 K.W. Ridgway M.G. Set, 550 V. D.C., 4160/2200 V. A.C., complete with switchboard equipment.
5—Goodman G1S Shaker Conveyor Drives, with 15 H.P., 250 V. D.C. Motor, starter and jacks included.
3—Goodman E1G16 Duckbill units, complete.
2—Goodman "Yo-Yos" (used on discharge end of 97HC30 belt conveyors)
2—Goodman 424BJ Permissible track-mounted Mining Machines complete, 42" gauge, 250 Volt D.C., 9 ft. Cutter Bar. Dimensions: 30" ht., 6 ft. width, lgth. 26 ft. Also spare complete cutting motor, assemblies and parts.
1—Mines Equipment Co. Type 24 Bit Heater with Oil Burner and Blower; complete (new and never used)
3—U-267-1AE Joy-Kellogg Tire Pump Compressors, 250 V. D.C. Complete
3—General Electric Co., 100 K.V.A., 1 phase, 60 cycle, Transformers, outdoor oil type. High voltage 4160, Low voltage 460/230.
1—General Electric Co. Auto-transformer, 3 phase, 60 cycle, Output 150 KVA, 4000 Volt Y to 2300 Volt Y.
1—General Electric Co. transformer, 100 K.V.A., 3 phase, double wound, 4000 volt primary, 2300 volt secondary, 60 cycle.
1—Joy CD-22 Rubber-tired Drill, Hydraulic, 250 Volt D. C.
2700—Hubbard Roof Bolts, ⅝" x 60" with Expansion Nuts.

The Valley Camp Coal Co.
P. O. Box 2008, Elm Grove, W. Va.
E. Braun, Maintenance Department
Telephone — Triadelphia 2010

M. G. SETS, SYN., 275 V DC, 1200 RPM, 2300/4000 V AC, FULL AUTOMATIC

2—300 KW West.
1—300 KW G.E.
4—200 KW G.E.

ROTARY CONVERTERS, TYPE HCC-6, 275 V DC, 1200 RPM, 2300/4000 V AC TRANSFORMERS

2—300 KW G.E.
4—200 KW G.E.
1—100 KW G.E.
2—250 KW West. Mine Type Rectifiers

STEEL TIPPLES AND WASHERS

1—5-Track Steel Tipple with Link-Belt No. 5035 Washer, 250-300 tons per hour capacity, complete with 4 large loading booms, shaker screens, vibrating screens, and all necessary appurtenances. Like new.
1—5-Track Jeffrey Steel Tipple with 4 large loading booms, shaker screens, rescreening plant, equipped with Nordberg mesh screens, capacity 200 tons per hour; 8' shaker screens, coal cleaner, Jeffrey 36 x 36 coal crusher, motors, and all necessary appurtenances.
Several other 3- and 4-track steel tipples suitable for strip, drift, slope or shaft mines.

LOADING MACHINES, 250 V DC

6—14-BU-3PE Joy
4—14-BU-7RBE Joy
6—11-BU Joy
6—8-BU Joy
10—7-BU Joy
2—Myers-Whaley No. 3 Automats, practically new
5—460 Goodman
2—460 Goodman
4—260 Goodman
5—L-600 Jeffrey
2—L-500 Jeffrey

LOCOMOTIVES, 250 V DC, BALLBEARING

2—20-ton Jeffrey MH-77
2—15-ton West. 910-C4
2—15-ton West. 908-C
2—15-ton Goodman 36-A
5—15-ton Jeffrey MH-110
4—13-ton G.E. MM-827
2—13-ton Jeffrey MH-110
1—10-ton Jeffrey MH-110
4—10-ton Goodman 34-B
12— 8-ton Jeffrey MH-100 with reels
3— 8-ton G.E. MM-819 with reels
4— 8-ton G.E. MM-834 with reels
Complete with new Jeffrey steel strip resistances. All have been rebuilt and any part showing any wear was replaced with new.

PERMISSIBLE TYPE, 250 V DC

4—Jeffrey 29-U
5—Jeffrey 29-UC
10—Jeffrey 35-BB
4—Jeffrey 35-BC
8—Sullivan 7-B on cats
6Goodman 512 on cats

AC CUTTING MACHINES — 220/440 V

2—Jeffrey 29-U
1—Jeffrey 24-B
3—Jeffrey 35-BB
1—Jeffrey 35-L
5—Goodman 12G3
3—Goodman 112G3
4—Goodman 112G3A
2—Goodman 112DG3A

ALL TYPES OF CABLE REEL SHUTTLE CARS, 250 V DC

ELECTRIC HOISTS

All types of Hoists from 100 HP to 1200 HP suitable for slope, shaft or drift mines.

STEEL MINE CARS

Several lots of Rotary Dump, End Dump, and Drop Bottom Mine Cars for high and low vein mines. Mail us your inquiries. We have them in lots from 100 to 600, track gauges 36" — 40" — 42" — 44".

WE SPECIALIZE IN BUYING OUTRIGHT COMPLETE MINES THAT ARE GOING OUT OF BUSINESS OR FROM RECEIVERS IN BANKRUPTCY, ADMINISTRATORS OF ESTATES, ETC.

COAL MINE EQUIPMENT SALES COMPANY

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306-307 BEASLEY BUILDING • LONG DISTANCE PHONE 34 • TERRE HAUTE, INDIANA

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28 SURPLUS NEW BELT CONVEYORS

30 INCH 1-136' — 1-270' — 2-350' — 1-418' — 2-500' — 1-1100' & 2-1500' Long.
36 INCH 1-160' — 2-250' — 1-320' — 1-400' — 1-590' — 2-1000' & 1-1600' Long.
42 INCH 1-144' — 1-290' — 1-377' — 1-575' — 2-700' — 1-800' — 2-1500' Long.

Extra Idlers—Terminals—Belts

STEEL STORAGE TANKS

26—8,000-10,000 & 20,000 Gal. Cap.

LOCOMOTIVES

20 TON WHITCOMB GASOLINE
65 TON G.E. DIESEL ELECTRIC
2—100 TON G.E. DIESEL ELEC.

DARIEN, 60 E. 42nd St., N. Y. 17

FOR SALE

McNally-Norton Pick Breaker 60" —— Type "A"
Coal Sizing without crushing.
This unit is not new but is in excellent condition.

GRAFTON COAL COMPANY
P.O. Box 1948 Clarksburg, W. Va.



M-G SETS—AC to DC

500 KW G.E. syn. converter, DC 275 v.
300 KW Whse. DC 600 v., Synch. Motor, 2300 v.
300 KW Allis Ch. DC 250 v., motor, 2200 v.
200 KW Whse. DC 275 v., synch. motor, 2300 v.
150 KW Whse. DC 275 v., motor 2300 v.
200 KW G.E. DC 125 v., syn. motor 440 v.
100 KW G.E. DC 275 v., motor, 2300/4000 v.
75 KW Whse. DC 250 v., motor, 2200/440 v.

Large Stock Whse. & late model D.C. motors.
Send for Complete New Catalog.

ARTHUR WAGNER CO.
1433 W. Randolph St. Chicago 7
ELECTRIC MOTORS - GENERATORS

LOCOMOTIVES

5—13 ton Jeffrey MH-110, 250 DC, 42" Ga.
1—20 ton Jeffrey MH-110, 250 DC, 42" Ga.
3—8 ton Jeffrey MH-100 250 DC 42" ga.
6—8 ton Jeffrey MH-80
4—6 ton Mancha Battery Type 48 coil, G-81-8 mtrs, 42" ga.
5—13 ton G.E. 42" ga.
20—6 ton Goodman, 42" ga.
5—8 ton Goodman, 42" ga.
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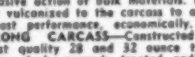
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20"	4	1/8"	1/32"	28 Oz.
20"	5	1/8"	1/32"	28 Oz.
24"	4	1/8"	1/32"	28 Oz.
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COAL AGE ADVERTISERS IN THIS ISSUE

MORE INFORMATION on any product advertised in COAL AGE may be easily secured by using the postage-free card facing p. 125.

*Acker Drill Co. 184
Aeroquip Corp. 51
Air Reduction Co. 174
Albert Pipe Supply Co. 136
Alemite Div., Stewart-Warner Corp. 108
*Allen & Garcia Co. 205
*Allis-Chalmers Mfg. Co. 29, 143
American Cable Div. of American Chain & Cable Co. ..... Third Cover
*American Car & Foundry Co. ..... Second Cover
American Crucible Products Co. 168
*American Cyanamid Co. Explosives Dept. 171
*American Mine Door Co. 206
*American Pulverizer Co. 181
*American Steel & Wire Div., United States Steel Co. 14-15, 40, 56-57
American Steel Foundries Co. 64-65
Anaconda Wire & Cable Co. 149
Armco Drainage & Metal Products, Inc. 148
Armstrong-Bray & Co. 194
*Ashland Oil Co. 179
*Atlas Car & Mfg. Co. 182
Atlas Powder Co. 34

Baker Mfg. Co. 180
Baltimore & Ohio Railroad 183
Barber-Greene Co. 185
*Bemis Bro. Bag Co. 186
Bethlehem Steel Co. 52A, 62, 66, 132
*Bird Machine Co. 4
Bituminous Coal Institute 198
Boston Woven Hose & Rubber Co. 30
*Bowdil Co. 31
Bucyrus-Erie Co. 36A

*Carboloy Dept. of General Electric Co. 12-13
Cardox Co. 37
Caterpiller Tractor Co. 20
Chevrolet Div., General Motors 164A
Cities Service Oil Co. 125
Coal Operators Casualty Co. 194
*Colorado Fuel & Iron Co. Insert between pp 132-133
*Columbia-Geneva Steel Div. 14-15, 40, 56-57
Commercial Shearing & Stamping Co. 158
Compton, Inc. 24-25
*Continental Gin Co., Industrial Div. 200

*Dart Truck Co. 204
*Davis Co., Nelson L. 132A
*Deister Concentrator Co. 144
*Deming Co. 186
*Dings Magnetic Separator Co. 46
Dodge Mfg. Corp. 18-19
*Dorr Co. 58
Durakool, Inc. 182
duPont de Nemours & Co., E. I., (Explosives Dept.) 39
duPont de Nemours & Co., E. I. Textile Fibers Dept. 22
Duff-Norton Mfg. Co. 160

Eagle Iron Works 170
Eaton Mfg. Co. ..... Insert between pp. 52-53
*Eimco Corp. 28
*Electric Storage Battery Co. 41
*Elreco Corp. 105
*Ensign-Bickford Co. 68
*Enterprise Wheel & Car Corp. 195
*Euclid Road Machinery Co. 109

*Fairmont Machinery Co. 49
Firestone Tire & Rubber Co. 129
*Firth Sterling, Inc., Mining Div. 103
Flexible Steel Lacing Co. 209
Flexible Tubing Corp. 47
*Flood City Brass & Electric Co. 172
Foote Gear Works, Inc., Brad 188
Fuller Co. (Transmission Div.) 141

Gates Rubber Co. 53
*General Electric Co. 209
Gilson Screen Co. 172
*Goodman Mfg. Co. 36
Goodrich Co., B. F. 1
Goodyear Tire & Rubber Co. 23
*Goyne Steam Pump Co. 207
Gulf Oil Corp. 157
Gulf Refining Co. 157
Guyan Machinery Co. 202

Harnischfeger Corp. 35
*Hazard Insulated Wire Works 52
*Hendrick Mfg. Co. 170
Hercules Powder Co. 164
*Heyl & Paterson, Inc. 60
Holmes & Bros., Inc., Robt. 40
Hough Co., Frank G. 67
Hulburt Oil & Grease Co. 2-3

Indiana Bearings, Inc. 46
*Indiana Foundry Co. 206
International Harvester Co. 36D, 151
Iowa Mfg. Co. 199

*Jeffrey Mfg. Co. 10-11, 54-55
*Jones & Laughlin Steel Corp. 153
*Joy Mfg. Co. Insert between pp. 20-21, 115, 131

*Kennametal, Inc. 113, 118
King Powder Co. 181
Koppers Co., Inc. 197
Klockner-Humboldt-Deutz, A. G. 152

LeRoi Co. 147
LeTourneau, Inc. R. G. 176-177
*Lee-Norse Co. 156
*Leschen & Sons Rope Co., A. 190
*Link-Belt Co. ..... 16, 139, Fourth Cover
*Long Super Mine Car Co. Insert between pp. 164-165
Lubriplate Div., Fiske Bros. Refining Co. 207

Macwhyte Co. 61
Manhattan Rubber Div. 63
*Manitowoc Engineering Works 208
Marion Power Shovel Co. 165
Marvel Engineering Co. 191
*McLanahan & Stone Corp. 109
McNally-Pittsburgh Mfg. Co. Insert between pp. 36-37
*Merrick Scale Co. 162
Michigan Pipe Co. 150
Mine & Smelter Supply Co. 162
*Mine Safety Appliances Co. 44-45
*Morris Machine Works 138

*National Tube Div. 56-57
Neff & Fry Co. 202
*Nolan Co. 178

Ohio Brass Co. ..... Insert between pp. 116-117
*Okonite Co. 178
*Oliver United Fillers Co. 201

Paris Mfg. Co. 42
Pennsylvania Bearings, Inc. 46
Pennsylvania Drilling Co. 209
Peterson Filters & Engineering Co. 137
Pittsburgh Gear Co. 188
Plastic Pipe & Extrusion Co. 209
Post-Glover Electric Co. 203
*Prox Co., Frank 161

*Quaker Rubber Corp., Div. of H. K. Porter Co., Inc. 121

Raybestos-Manhattan, Inc., Manhattan Rubber Div. 63
*Republic Rubber Div., Lee Rubber & Tire Corp. 189
Roberts & Schaefer Co. 192
Roebling's Sons Co., John A. 167
Rollway Bearings Co. 50
*Ruberoid Co. 142
Rust-Oleum Corp. 155

*Salem Tool Co. 194
*Sanford-Day Iron Works 38
*Screen Equipment Co. 163
Searchlight Section 210-215
*Simplex Wire & Cable Co. 59
Sinclair Refining Co. 145
Spang & Co. 168
*Sprague & Henwood, Inc. 184
Stamler Co., W. R. 166
Standard Oil Co. (Indiana) 43
Stulz-Sickles Co. 158

Templeton-Kenly Co. 146
*Tennessee Coal & Iron Div. 14-15, 40, 56-57
Texas Co. 6-7
*Thermoid Co. 133
Thurman Machine Co., Scale Div. 204
Tide Water Associated Oil Co. 21
*Timken Roller Bearing Co. 8-9
Trabon Engineering Corp. 126
*Twin Disc Clutch Co. 140

Union Wire Rope Corp. 32-33
United States Rubber Co. 107, 169
*United States Steel Co. 56-57
*United States Steel Export Co. 14-15, 40, 56-57
*United States Steel Supply Div. 56-57
Upson-Walton Co. 196

Victaulic Co. of America 123

*Wedge-Wire Corp. 174
*Wellman Engineering Co. 154
West Virginia Bearings, Inc. 46
Western Machinery Co. 175
Westinghouse Electric Corp. 26-27
*Wickwire Spencer Steel Div., Colorado Fuel & Iron Corp. Insert between pp. 132-133
*Wilmot Engineering Co. 17, 173
Winslow Scale Co. 166
Wyandotte Chemicals Corp. 207

Yuba Mfg. Co. 199

PROFESSIONAL SERVICES 196, 197

SEARCHLIGHT SECTION

(Classified Advertising)
H. E. Hilty, Mgr.

EMPLOYMENT
Positions Vacant 210
Selling Opportunities Offered 210
Positions Wanted 210
EDUCATIONAL
Books 210
BUSINESS OPPORTUNITIES
Offered 210
NOTICES
Auction 210
PROPERTY
For Sale 210
EQUIPMENT
(Used or Surplus New)
For Sale 210-215
Rail 214
WANTED
Equipment 210

ADVERTISERS' INDEX

Albuquerque Iron & Metal Co. 213
Benney Equipment Co., R. H. 215
Berman, Joe 213
Blackburn & Co., W. R. 215
Bonded Scale & Machine Co. 215
Buckeye Trading Co. 214
Carlyle Rubber Co. 213
Chemico Co. 210
Coal Mine Equipment Sales Co. 213
Darien Corp. 210, 213
Davis, Samuel M. 212
E & S Coal Co. 210
Electric Equipment Co. 212
Electric Service Co., Inc. 212
Farland Fuel Corp. 210
Fish & Co., J. T. 215
Forke Bros. 210
Foster Co., L. B. 214
Frank, M. K. 214
Grafton Coal Co. 213
Greensburg Machine Co. 212
Hair, Edwin C. 210
Halbritter, L. C. 210
Hawkins & Co. 213
Industrial Dismantling of Salvage Co. 214
Ironton Engine Co. 212
Kaiser Steel Co. 214
Kirk Co., Wallace E. 212
Leftan Industrial Corp. 212
Midwest Steel Corp. 214
Moorhead Electric Machinery Co. 212
Morse Bros. Machinery Co. 211
Mulzer Brothers 215
O'Neill, A. J. 212
Peerless Coal & Coke Co. 215
Pierce Cable Co. 210
Shaner, K. O. 212
Simpson, T. L. 210
Snap Creek Coal Co. 215
Southern Machinery Exchange, Inc. 214
South Texas Machinery Co., Inc. 214
Tippins Machinery Co. 212
Valley Camp Coal Co. 213
Wagner Co., Arthur 213
Western Coal Co. 215

* Indicates that detailed information may be found in the 1951-1952 MINING CATALOGS.

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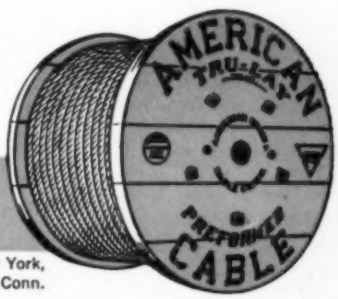


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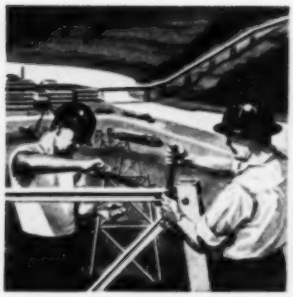
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